The Iron Age

A Review of the Hardware, Iron and Metal Trades.

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The San Francisco System of Street Railroads.

The system of street cars has been so universally adopted in the United States and abroad, and has proved so cheap and convenient a way of transporting passengers in and about centers of population, that many attempts have been made to increase its efficiency. The efforts of inventors have been directed principally toward finding some substitute for horseflesh; and steam, compressed air and electricity have been tried in many different forms without, however, achieving any marked or sustained success. There is one system of which little is generally known, although it has been in successful operation in San Francisco, Cal., for a number of years, and as attention is being directed to it in connection with some of our Western cities, a brief account of its principal features may be of interest.

The streets of San Francisco north of Market street are narrow, and the grades are very uneven, and in many instances excessive. They are laid out in right angles 412.5 feet apart, the crossings being, of course, level. It was in consequence of being a witness of an accident on a steep part of an ordinary horse car line that Mr. A. S. Hallidie, an engineer of San Francisco, thought of applying a system of wire traction, which he had used, of course in a different form, for the transportation of rocks and other materials. A year later, in 1870, Mr. Hallidie interested two gentlemen of means in his undertaking, and after his preliminary experiments were completed, a company was organized to build the first line. There was so little faith in the future of the enterprise that only 160 shares were sold to the public. The road was commenced in June, 1872, and was finally completed September 1st, 1872.

Our illustrations may serve to convey an idea of the principles involved. The system consists in the use of an endless wire rope placed in a tube below the surface of the ground between the tracks of the line. It is kept in position by means of sheaves, upon and beneath which the rope is kept in motion by a stationary engine located at some convenient point along the line. The power is transmitted from the motor to the rope by means of grip pulleys, which seize and release the rope automatically and prevent it from slipping. This endless steel wire rope travels in one direction in one tube and in the other direction in the second tube. Along the entire length of each tube is a slot seven-eighths of an inch wide (see Fig. 1). It is not immediately over the center of the tube, in order to keep sand and dirt from falling on the rope, to clear the upper sheaves and to enable the foot of the gripping attachment to pass by and under the upper sheaves and over the lower sheaves in the tube.

The connection between the cars on the street and the traveling rope is made by means of this gripping attachment, which is mounted in a "dummy" under control of the driver, as shown in Fig. 2. The gripping attachment has a vertical slide working in a standard, and moved up and down by a screw and hand-wheel. At the lower end of this slide is a wedge-shaped block, which actuates horizontally two jaws, closing or opening around the rope, according to the direction in which the slide is moved. On both sides of these jaws and attached to them are two small sheaves. They are held, by means of rubber cushions, sufficiently in advance of the jaws to keep the rope off from the latter, and at the same time to lead the rope fairly between them, allowing it to travel freely between the jaws, when they are separated, without touching them. When the car is to be set in motion the slide is drawn up; the wedge at the lower end closes the jaws over the rope, at the same time forcing back the small guide sheaves on to the rubber springs. In order to stop the car the jaws of the gripping attachment are opened slightly, thus releasing the rope, which is taken up by the guide sheaves. In order to keep the rope taut under all circumstances, a stretching arrangement is provided. The speed of the rope is from 6 to 7 miles per hour, and the power naturally varies according to nature and length of road. In the case of the Clay Hill line, 5197 feet long, an engine with a 14 x 28-inch cylinder is required, the consumption of fuel being 3700 pounds of coal per day. The weight of the car going down hill also aids in drawing up the car on the other track.

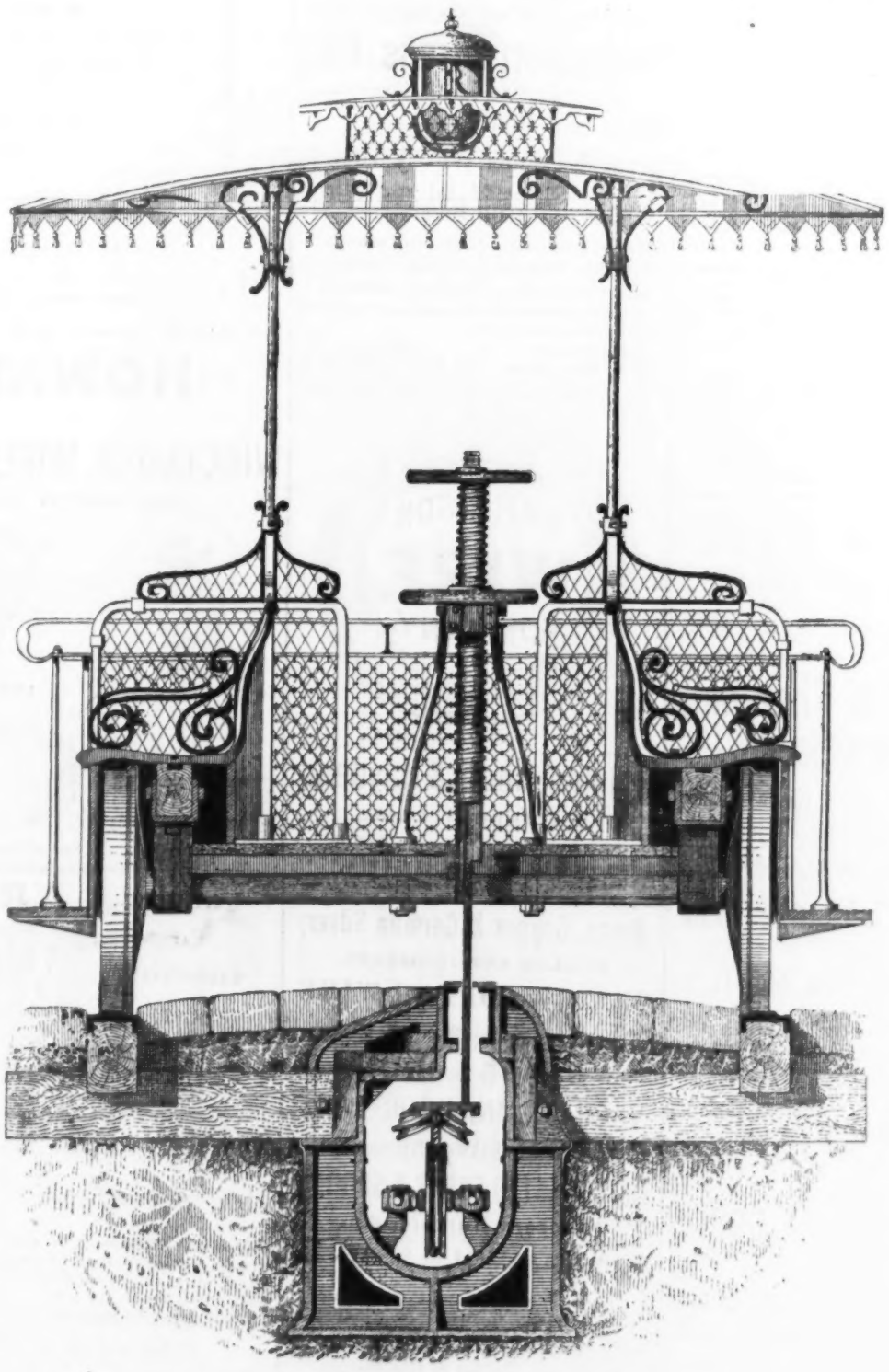

Fig. 1.—Section through Dummy and Road Bed.

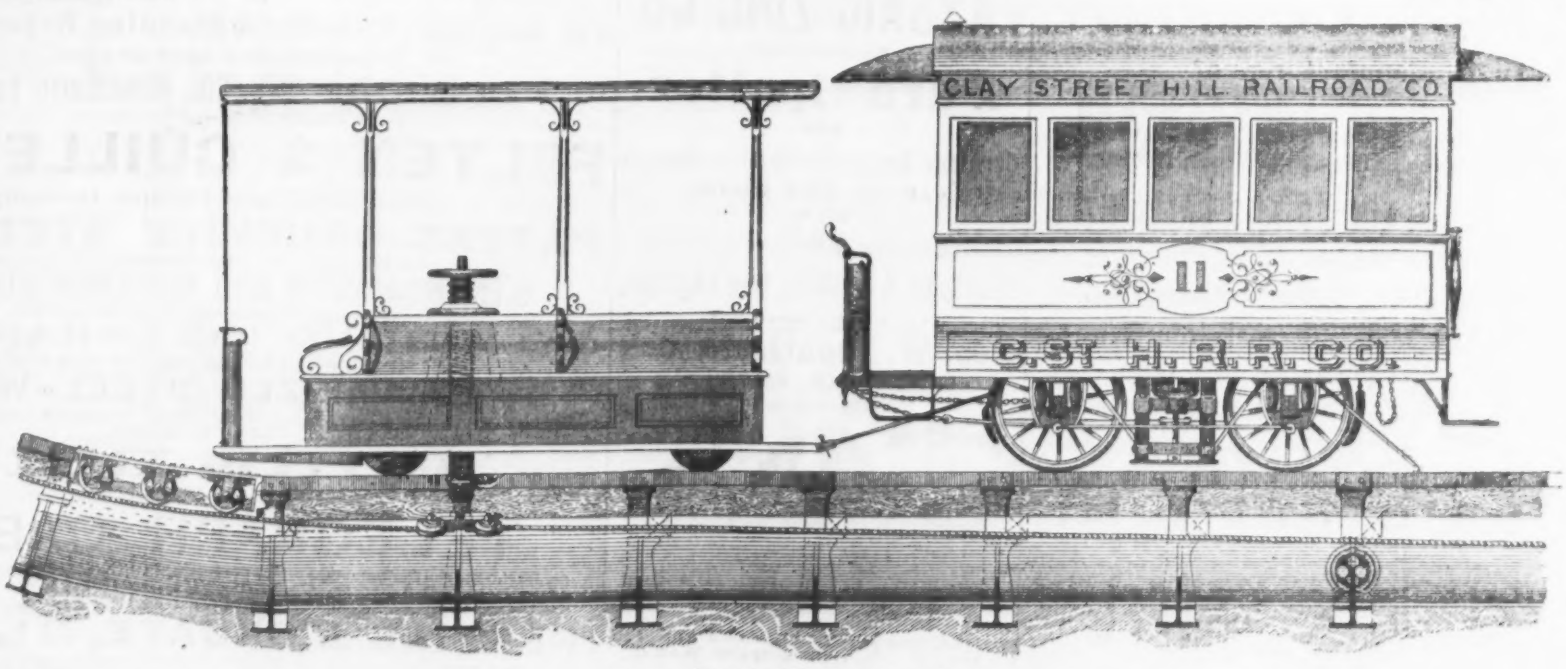

Fig 2.— Passenger Car and Dummy.

THE HALLIDIE SYSTEM OF WIRE ROPE TRACTION FOR STREET CARS.

The "dummy" is coupled to the passenger cars, there being seats for 14 passengers in the latter, while there are 16 in the dummy. Both together have, however, carried as many as 70 passengers, and the roads with broad gauge have taken as many as 160. In addition to the ordinary brakes there is another attachment, which forces a broad band of wood on each track immediately under the car (see Fig. 2). Strong iron drags are provided, so that if an accident should occur in going up hill they will immediately catch in the street, and prevent the car from going backward. On a descending incline of 1 in 7 the car and dummy has been stopped within a distance of 2 feet.

The first line built was the Clay street road, running over the top of a hill a distance of 3300 feet, an elevation of 320 feet being reached in a distance of 2600 feet, the steepest grade being 1 in 6.15. The gauge is 3.5 feet. The second line was built by the Sutter Street Railroad Company, operating 16,000 feet, the greatest elevation above the initial point being 167 feet. The California Street Railroad has 12,000 feet of line, and it passes in that distance over two elevations, the hights being 265 and 235 feet above base respectively, the valley between being 125 feet above base line. Another line, the Geary Street Railroad, runs over comparatively level ground, and one new road two miles long is now building, with others in contemplation. Experience with the system has been favorable, and even those lines which do not encounter heavy grades are beginning to adopt it, as it appears to prove more economical.

Underground Haulage of Coal with Wire Rope.

The Beech Mountain (Pa.) Coal Company, in a letter to Messrs. J. A. Roebling's Sons Co. gives the following interesting information:

I have the pleasure of reporting to you the successful working of the gangway ropes haulage, which I introduced in February of last year. The rope, which is one mile long, made endless, makes the full length of the haul half a mile. I pick up the loaded trains of cars at two points, one of which is half a mile from the slope, and the other about a quarter of a mile from the same point. The load hauled is from 50 to 80 tons, including weight of cars. The only doubtful feature in the system which presented itself to my mind was as to the life of the rope. The curves on which the rope works are very short, in fact, as short as any that one is apt to see in the practice of mining coal. The rope hauled last year about 60,000 tons. Most of the wear on the rope took place when it was first started, as the strain was hard on it before the pulleys were properly located on the curves. The rope was once broken by an accident, entailing an expense of $75 for repairs. I am of the opinion that, accident excepted, my rope will last to haul from 150,000 to 200,000 tons of coal. The rope is driven by a 14 x 36 inch engine. I would, however, prefer a pair of 10-inch engines, as I would get a steadier pull on starting.

The advantages are many over those of an underground working locomotive—no gas, much lighter rail, less wear and tear on roads, and the rope can be used where it would be impossible to use a locomotive. To haul 100,000 tons of coal half a mile the plant, for the working of a rope (excluding boilers) would cost less than the mules necessary for hauling the same amount of coal the same distance. The daily cost of running the rope is $5.25 for labor, and for tar and oil about 75 cents. This does not include the cost of making steam, as that is done by the fireman at the regular hoisting slope. The steam is taken from the surface, and the additional cost for coal is not calculated. The expenses for running would have been but slightly increased had I hauled 120,000 tons, or double the actual quantity above stated. When idle there are no expenses, such as mule feed and attendance.

I conclude that the capacity of my rope is 200,000 tons with expenses as stated, and that it can be made to work successfully on any curve that may be met with in driving gangways. The rope could be made to pick up its trains along the gangways, but this would be seldom required, the usual practice being to make up the trains at some main turnout, the cars being delivered to this point by mules.

The rich and extensive deposits of magnetic iron ores in Stokes County, N. C., will be rendered accessible by railroads now building in that section, and an important development is promised. These ores are said to be exceptionally free from phosphorous, and are found in close proximity to the Piedmont coal measures and excellent lime and building stones, timber and water power. Some years ago a few capitalists, including Mr. William Sharswood, of Philadelphia, became interested in some of these iron lands, but, notwithstanding the possibilities for making a high grade of iron in that region, attempts at development have been delayed for want of transportion, the nearest railroad communication being 20 miles distant. It is proposed, in view of the transportation facilities that will soon be afforded by one or more of these railroads, to organize a company that may obtain control of all the iron lands in that county, which extend on Dan River for six miles in a northwesterly direction from Danbury, when this isolated mountainous region would likely become a thriving seat of the iron industry. Much attention is now being drawn to the iron lands of North Carolina.

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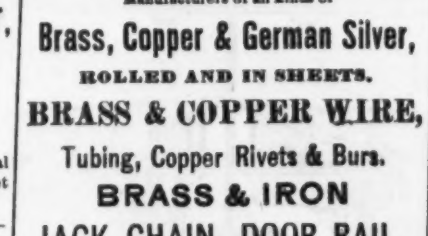

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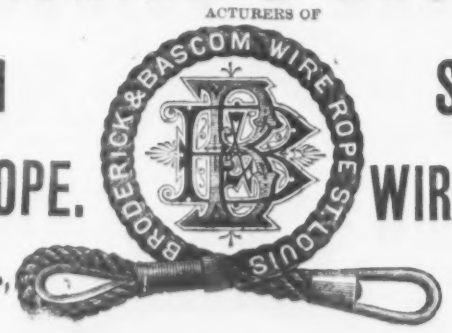

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The Use of Steel.

Mr. Henry Seebohm, of Sheffield, delivered the following interesting lecture before the Company of Cutlers of the city of London:

The first question which the user of cast steel has to answer is, to decide which of the three great methods of making steel produces a material best adapted to his own wants. Sir Henry suggested to you in his admirable lecture, that Bessemer steel would answer every purpose for which steel is used, with the possible exception of the steel required to make Canadian axes. There can be no doubt whatever that the Bessemer steel of which Sir Henry gave you the first analysis, would have made an excellent Canadian ax had it contained the proper quantity of combined carbon. The only doubt I feel is, whether it could be produced of sufficient soundness without so large a percentage of waste as not to raise the price beyond that at which crucible cast steel for Canadian axes is now sold. I must confess that my experience of Bessemer cast steel would incline me to say that it could not. No doubt the English are an intensely conservative nation, and no doubt the prejudice which leads us to do exactly as our forefathers did is very strong. No one knows better than I do the despotic sway of the rule of thumb in Sheffield. I must, however, confess that this rule is a very excellent and safe guide until you have found a better. Chemical analysis is by no means unknown in Sheffield. I may tell you that for the last ten years no steel has been sold by the firm of which I am a member of which we did not know the chemical analysis of all the important ingredients, except carbon. We do not analyze for carbon, because we find by long experience that the eye can judge of the percentage of carbon in an ingot of cast steel of the highest tempers from the appearance of the fracture more accurately than the chemist can ascertain by any method of analysis hitherto discovered. In spite of the prejudice that exists among consumers of steel, and in spite of the conservatism of Sheffield steel manufacturers, such is the competition of the present day that I am sure that if steel could be produced of as good quality, and cheaper in price, by any other process than that of melting in crucibles, the present melting furnaces of Sheffield would rapidly melt away into old bricks and mortar. I remember once trying to make a quantity of gun barrels, which had to stand a somewhat severe test, from Bessemer steel. I tried samples from some of the best makers in the trade, but they all failed from one of two causes. If the steel was soft enough to stand the test, I had to break up 40 to 50 per cent. of the barrels for scrap, because they were unsound. If the barrels were sound, they were so hard that they would not stand the test. The percentage of carbon by analysis was the same in both cases, but in order to produce a sound steel the maker of the hard billets had been obliged to add manganese or silicon. The end of it was that I was obliged to cut up my unsound barrels and melt them in crucibles, a process which gave me, with care, both the qualities which were indispensable—soundness and softness. This may be an extreme case, but I venture to express the opinion that the reason that high-class Bessemer steel is not so good as high-class crucible cast steel, is because the former cannot yet be made sufficiently sound without the admixture of silicon or manganese, both of which substances are injurious to cast steel for most purposes. I fear that the advantages supposed to be derived from the use of manganese in the manufacture of cast steel, are to a large extent illusory. I have frequently conversed with consumers of steel who knew the trade before the introduction of spiegel iron into Sheffield, and it is remarkable how many of them expressed the opinion that the crucible cast steel now in use is not so good as it was when they were young. Something may, perhaps, be allowed to the illusions of youth. But, nevertheless, I am convinced there is much truth in the opinion that the quality of cast steel has degenerated. In the present day we sacrifice much to appearances. Our cotton, our paper and our steel may or may not be good, but it must look pretty. For my part, I always distrust a bar of steel that has not a "seam" or a "roak" in it. The introduction of manganese into cast steel is a rough-and-ready way of obtaining soundness at the expense of quality, instead of obtaining it by the tedious care and attention which the steel melter who knows his business gives to each individual crucible—a control which, it appears to me, cannot be exercised to the same degree over the Bessemer converter.

"KILLING" STEEL.

To obtain sound ingots from high-class iron it is necessary to boil the steel for nearly half an hour after it has become fluid, and then to allow it to cool down to a certain temperature before it is poured into the mold. The process is called, in the language of the votaries of the rule of thumb, "killing" the steel, and it is an axiom among them that the higher the quality of the steel the more "killing" it takes. It is in this part of the process of crucible cast steel melting that the virtue of the process consists; and and the cost and quality of the cast steel produced depend in a large degree upon the skill brought to bear upon it. We have an old proverb in Sheffield, which we express in the terse vernacular of the county, that if you put His Satanic Majesty in the pot His Satanic Majesty will come out. The converse of this is by no means the case. You may put the most angelically-pure steel into the pot, but by bad management you may pervert it into satanically-bad ingots. I wish I were chemist enough to give you a scientific explanation of "killing" steel in the crucible. My theory on the subject is as follows:—In the process of cementing iron into steel in the converting furnace, the agent by which the carbon is conveyed to the iron is represented as carbonic oxide, which is forced by the iron to part with a portion of its carbon sufficient to reduce it to carbonic acid. It has been ascertained that metals have the power of absorbing, or "occluding" as it is technically called, many times their own bulk of gas; and my theory is that this carbonic oxide, when it has parted with the amount of carbon necessary to reduce it to carbonic acid, is not then expelled from the iron, but remains in an "occluded" state; and this may account for the fact that, if it is required to make blister steel harder than about 1.4 per cent. of carbon, it is necessary to convert it twice over, so that in the interval it may part with some of its occluded carbonic acid, so as to make room for a further occlusion of carbonic oxide. If this theory be correct, we might find that blister steel which is exposed to the air for a length of time would part with some of its occluded gas. It is admitted that steel melted directly after being drawn from the converting furnace does require more "killing." It is popularly said to be more "fiery." My theory is that the reason why high-class steel has to be so long boiled is to get rid of its occluded gas, which would otherwise produce bubbles or "honeycombs" in its attempts to escape. The addition of a portion of scrap steel much assists the "killing," as would naturally be the case if we suppose the scrap, which has been melted before, to have parted with its occluded gas in the first melting. That the presence of manganese or silicon helps largely to "kill" the steel, I can account for on the theory that the carbonic acid unites with the manganese or silicon and becomes a solid. So far my theory appears to hold water pretty well; but when I come to the fact that low-quality cast steel—for example, steel melted from Bessemer rail scrap, which contains from 0.15 to 0.05 per cent. of phosphorus—does not require any "killing" at all, and may be poured into the mold as hot as the strength of the crucible will allow, I am obliged to admit, as I said before, that I am not chemist enough to give you an explanation of the cause. The main point which I wish to impress upon you is, that the much-maligned rule of thumb, which insists upon the superiority of crucible cast steel over Bessemer steel for certain purposes, may have a scientific basis, and must not be hastily set aside as prejudice. It is deeply to be regretted that too many consumers of steel should hastily reject bars because a few "roaks" are visible on the surface, and, by insisting upon having soundness at any cost, rush from evils that they know, and at small sacrifice may avoid, to greater evils which they cannot see or remedy. The few "roaks" may be a certificate of the high quality of the material melted, though I do not attempt to conceal from myself that they also may be certificates of the clumsiness of the maker.

TEMPERING.

Having decided by what process the steel is to be made, the question that should come before the consumer of cast steel is the percentage of carbon which he wishes it to contain. When I first began business, the "temper" of steel, or the percentage of carbon which it contained, was concealed from the consumer. The despotic sway of the rule of thumb was absolute. If the consumer discovered that chisel steel contained less carbon than tool steel, he owed his discovery entirely to his own wit. My firm was the first to take the consumer into our confidence, and the success which has attended our efforts, and the extent to which our labels have been imitated, have completely justified our act. We have always labeled the steel we supplied to consumers with the percentage of carbon it contained, and the purposes to which, in our opinion steel containing such percentage of carbon was applicable. The following is a list of the most useful "tempers" of cast steel:

Razor Temper (1½ per cent. carbon).—This steel is so easily burnt by being overheated that it can only be placed in the hands of a very skillful workman. When properly treated, it will do twice the work of ordinary tool steel for turning chilled rolls, &c.

Saw-file Temper (1⅜ per cent. carbon).—This steel requires careful treatment, and although it will stand more fire than the preceding temper, should not be heated above a cherry red.

Tool Temper (1¼ per cent. carbon).—The most useful temper for turning tools, drills and planing-machine tools in the hands of ordinary workmen. It is possible to weld cast steel of this temper, but not without care and skill.

Spindle Temper (1⅛ per cent. carbon).—A very useful temper for mill-picks, circular cutters, very large turning tools, taps, screwing dies, &c. This temper requires considerable care in welding.

Chisel Temper (1 per cent. carbon).—An extremely useful temper, combining, as it does, great toughness in the unhardened state, with the capacity of hardening at a low heat. It may also be welded without much difficulty. It is, consequently, well adapted for tools, where the unhardened part is required to stand the blow of a hammer without snipping, but where a hard cutting edge is required, such as cold chisels, hot salts, &c.

Set Temper (⅞ per cent. carbon).—This temper is adapted for tools where the chief punishment is on the unhardened part, such as cold sets, which have to stand the blows of a very heavy hammer.

Die Temper (¾ per cent. carbon).—The most suitable temper for tools where the surface only is required to be hard, and where the capacity to withstand great pressure is of importance, such as stamping or pressing dies, boiler cups, &c. Both the last two tempers may be easily welded by a mechanic accustomed to weld cast steel.

Next to quality, by which is meant the percentage of phosphorus, sulphur, silicon, manganese, &c., the most important thing is temper, or percentage of carbon. For many purposes, indeed, temper is of more importance than quality. Nothing is more common than for steel to be rejected as bad in quality, because it has been used for a purpose for which the temper was unsuitable. We may divide consumers of steel into three classes. First, those who use their own judgment of what percentage of carbon they require, and instruct the manufacturer to send them steel of a specified temper; second, those who leave the selection of the temper to the judgment of the manufacturer, and instruct him to send them steel for a specified purpose; and third, those who simply order steel of a specified size, leaving the manufacturer to guess for what purpose it is required. For-

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tunately, the size and shape generally furnish some clue to the purpose for which it is likely to be used. For example, oval steel is almost sure to be used for chisels, and small squares for turning tools. One and one-quarter square may be used for a turning tool or a cold sets, 1¼ round for a drill or a boiler-cup, and the manufacturer has to puzzle his brains to discover whether the chances are in favor of its going into the lathe-room or the blacksmith's shop. It cannot too often be reiterated of how much importance it is, when ordering steel, to state the purpose for which it is going to be used.

IN USE.

When the steel has arrived in the user's hands, the first process which it undergoes is the forging it into the shape required. This process is really two processes. First, that of heating it to make it malleable, and second, that of hammering it, while it is hot, into the required shape. The golden rule in forging is to heat the steel as little as possible before it is forged, and to hammer it as much as possible in the process of forging. It is impossible to lay down exact rules for each of the thousand-and-one tools in which steel is used. The treatment of each tool in each process which it undergoes is an art that can only be learned by practice, and can no more be taught in a lecture than the arts of skating, riding or swimming. The utmost that can be done is to lay down certain general rules, and, if possible, to attempt some scientific explanation of them—to elevate them above the despised position of rules of thumb. The worst fault that can be committed is to overheat the steel. When steel is heated it becomes coarse-grained. Its silky texture is lost, and it can only be restored by hammering or sudden cooling. If the temperature be raised above a certain point, the steel becomes what is technically called "burnt," and the amount of hammering which it would require to restore its fine grain would reduce it to a size too small for the required tool, and the steel must be condemned as spoiled. Overheating in the fire is the primary cause of cracking in the water. The quality of steel may be so bad—*i. e.*, the percentage of phosphorus in it may be so high that the amount of heat absolutely necessary to forge it all into the shape required may cause it to crack in hardening. One of the principal reasons why a high-class quality of steel is required for certain purposes is that it will suffer less injury by being heated to a greater degree, or by being heated and reheated a greater number of times than inferior qualities of steel. In heating steel the happy medium must be attained between heating it too much and too little, and between letting it lie too long "soaking" in the fire, and not "soaking" it through. Both the degree of temperature and the duration of the heat must be carefully watched. Some tools, such as circular cutters, files, &c., after they are forged into the shape required, must have teeth cut into them. Before this can be successfully accomplished a preliminary process has to be gone through.

The process of hammering or forging the steel into the shape required has hardened the steel to such an extent as to make the cutting of the teeth into it impossible or difficult; it must consequently be annealed. This process, like the preceding one, is a double process. The steel must be reheated as carefully as before, and afterward cooled as slowly as possible. Many tools are only required to be hardened on a small part of their surface, and it is important that the unhardened parts should possess the maximum amount of toughness—the minimum amount of brittleness that can be attained. These tools must also be annealed after they are forged. The process of annealing, or slow cooling, leaves the steel coarse-grained, gives it its maximum of ductility, and causes it, in fact, to approach the properties of lead.

HARDENING.

We now come to the culminating point in our manufacture, where the invaluable property which distinguishes steel from wrought iron or cast metal is revealed, a process by which we suddenly change our steel from lead into glass—the process of hardening. In this, as in all other processes which steel has to undergo, we have to run the gauntlet of fire. We do so, however, at greater risk than heretofore. The forging of our tool finished, it has taken the final shape to which we have destined it, and whatever injury we inflict upon it by overheating is irrevocable, and can no more be cured or mitigated by the hammer. We must, therefore, double and redouble our care, lest the temperature be raised above the point necessary to insure the required hardness. The part of the tool required to be hardened must be heated through, and heated evenly, but must on no account be overheated. Our tool must be finished at one blow—the blow caused by the sudden contraction of the steel produced by its sudden cooling in the water—and if this blow is not sufficient to give to the steel a fine grain and silky texture—if, after the blow is given, the fracture, were it broken in the hardened part, should show a course grain and dull color, instead of a fine grain and glossy luster, our tool is spoiled, and must be consigned to the limbo of "wasters." The special dangers to be avoided in hardening each kind of tool must be learned by experience. Some tools will warp or "skeller," as we say in Yorkshire, if they are not plunged into the water in a certain way. Tools of one shape must cut the water like a knife; those of another shape must stab it like a dagger. Some tools must be hardened in a saturated solution of salt, the older the better, while others are best hardened under a stream of running water. Most tools have a tendency to water crack if taken out of the water before they are absolutely cold. Where the edge of a tool only is hardened, care should be taken to move it up and down in the water, so as continually to change the water level, lest the tool should crack at the water level. Steel contracts in hardening, and contracts most where it is cooled most suddenly. If the hardened part join on to the unhardened part too suddenly, the steel at the junction will be in a dangerous state of tension which predisposes it to crack, and it is wise to lessen the amount of tension by distributing it over as great an area as possible. In some tools, where the shape necessitates a great difference in the rapidity of cooling, it is

wise to drill holes in the thicker parts where they will not interfere with the use of the tool—holes which are made neither for use nor ornament, but solely with a view of equalizing the rapidity of the various parts, so as to distribute the area of tension and thus lessen the risk of cracking in hardening. So many causes may produce water-cracks that it is often difficult to point out the precise cause in any given case. Perhaps the most common cause is overheating the steel in one or more of the processes which it passes through in the consumers' hands, or it may have been overheated in the process of forging, or rolling it into the dimensions required while in the hands of the manufacturer. A second cause may be found in the over-melting, or too-long boiling of the steel, causing it to part with too much of its occluded carbonic acid, a fault which may be attributed to the anxiety of the manufacturer to escape honeycombs in the ingot. A third cause may be sometimes discovered in the addition of too much manganese added with the same motive. A fourth cause may, curiously enough, prove to be a deficiency of carbon, while, in some cases, too much will produce the same effect. A fifth cause may be one which, as a steel manufacturer, I ought to mention in a whisper—the presence of too much phosphorus in the steel; but, after all, this may not be the fault of a greedy manufacturer, who wants to make too great a percentage of profit. It might be the fault of a stingy consumer, who begrudges him the little profit he makes. You may depend upon it there is nothing so dear as cheap steel. It must be more economical to put five shillings' worth of labor upon steel that costs a shilling, to produce a tool that lasts a day, than to put the same value of labor upon steel that costs only ninepence, to produce a tool that only lasts half a day. I am sure that the system adopted by some large consumers of buying tool steel by tender is one which in too many cases defeats the object for which it was instituted, and, by lessening the price, and consequently deteriorating the quality, causes the steel bill to be lessened at the cost of the labor bill, so that extravagance, instead of economy, is the result. In fact, it is an illustration of the proverb about being penny wise and pound foolish.

Our difficulties are not quite over when the process of hardening has been successfully accomplished. Our steel was originally lead; it has now become glass. But we do not want glass—it is too brittle; we want whalebone. An unhardened knife would bend like wrought iron; a knife hardened only would break like cast metal. We want both qualities combined—the bending quality of the iron and the resisting quality of the metal. We want the elasticity of the whalebone. Our knife must spring like—like what?—like steel. To attain this our tool must pass through the final process—that of tempering.

If you heat a piece of hardened steel slightly, and allow it to cool again, it becomes tempered. It suddenly changes from glass to whalebone; and in the process of changing its nature, it fortunately changes its color, so that the workman can judge by the hue of the color the extent of the elasticity which it has acquired, and can give to each tool the particular degree of temper which is most adapted to its special purpose. The various colors through which tempered steel successively passes are as follows: Straw, gold, chocolate, purple, violet and blue. Of course, in passing from one color to another, the steel passes through the intermediate colors. It really passes through an infinite series of colors, of which the six above mentioned are arbitrarily selected as convenient stages.

It must be borne in mind that the elasticity of tempered steel is acquired at the expense of its hardness. It is supposed that the maximum of hardness and elasticity combined is obtained by tempering down to a straw color. In tempering steel regard must be had to the quality most essential in the special tool to be tempered; for example, a turning tool is required to be very hard, and is generally taken hot enough out of the water to temper itself down to a degree so slight that no perceptible color is apparent, while a spring is required to be very elastic, and may be tempered down to a blue. If you ask me to give you a scientific explanation of the process of tempering steel, I must confess my absolute ignorance. The utmost I could do would be to mystify you by talking unintelligibly about molecular rearrangement and crystalline transformations.

Hardening in oil is another mode of treating steel, which appears to a certain extent to attain by one process the change from lead into whalebone without passing through the intermediate glass stage, and is of great value for certain tools.

The processes with which the user of steel has to become familiar are complicated, but the manufacture of steel is equally so. I have said nothing about bar steel, by which is understood rolled or hammered blister steel; or about shear steel, or of puddled steel, which is produced by arresting the process of puddling cast iron into wrought iron at the point at which it becomes steel. Nor have I made any mention of the various ways in which the percentage of carbon required in crucible cast steel may be attained. We may convert or cement our blister steel exactly to the percentage of carbon required in the cast steel. We may cut up our iron into pieces and convert it in the pot either by adding the amount of charcoal necessary to raise it to the required percentage, or by adding an amount of speigel iron sufficient to produce the same effect; or we may convert our blister steel much harder than we require, and "let it down" to the percentage wished for by the addition of cut iron.

SPECIAL STEELS.

There are also many kinds of steel to which your attention should be called, but which can only obtain from me the briefest mention. A special steel for taps, called mild-centered cast steel, is made by converting a cogged ingot of very mild cast steel, so that the additional carbon only penetrates a short distance. These bars are afterward hammered or rolled down to the size required, and have the advantage of possessing a hard surface without losing the toughness of the mild center.

Another special steel, somewhat analogous to mild-centered cast steel, is produced by melting a hard steel on to a slab of iron, or very mild steel heated hot enough to weld with the molten steel, so that a bar may be produced, one-half of which is iron and the other half steel, or three-fourths iron and one-fourth steel, as may be required.

A third kind of special steel, which is used for turning tools for chilled rolls, magnets and some other purposes, is made by adding a certain percentage of wolfram, or, as the metal is more generally called, tungsten, sometimes with and sometimes without carbon, sometimes to such an extent that it can be used without hardening in water. Special steel of this kind is the finest-grained that can be produced, but it is so brittle that in the hands of any but exceptionally skilled workmen, it is useless. The addition of chromium, instead of wolfram, has somewhat the same effect.

TESTING.

It is much to be regreted that no easy method of testing cast steel has been invented. The amount of breaking strain and the extent of the contraction of the area of the fracture are all very well for steel which is not hardened, and not required to be used in a hardened state, but for hardened and tempered steel it is practically useless. It is very difficult to harden and temper two pieces of steel to exactly the same degree. A single test is of comparatively small value, as a second-rate quality of steel may stand very well the first time of hardening, but deteriorates much more rapidly every time it is rehardened than is the case with high-quality steel. Nor am I at all sure that the breaking strain is a fair test of the quality of steel. For many tools the capacity to withstand a high amount of breaking strain slowly applied is not so much required as its capacity to withstand a sudden shock. The appearance of the fracture is very illusory. The fineness of the grain and the silkiness of the gloss is very captivating to the eye, but it can be produced by hammering cold. The consumer of steel may be enraptured by the superb fracture of a bar of steel; but, after all, this is only a dodge, depending upon the inclination of the axis of the revolving hammer to the plane of the anvil. The practical consumer of steel must descend from the hights of art and science and take refuge in the commonplace of the rule of thumb, and buy the steel which his workmen tell him is full of "nature" and "body."

Pittsburgh's Smoke.

A company has been organized in Pittsburgh and has applied for certain rights to lay mains, &c., which proposes to rid that city of a part of its smoke nuisance. The following particulars are printed by the *Dispatch*:

A call was made yesterday on Mr. Smith, and he was questioned relative to the project. He stated the object to be to furnish a cheap gas, not for illuminating, but for heating purposes, a fuel that would always be ready to convert into heat in an instant, merely by the application of a match, one that would save labor, dirt and ashes. Messrs. Smith & Markle have been granted a patent on a coke-burning oven by which all the bi-products, sulphur, ammonia, free carbon, tar and soot can be converted into gas, of but eight candle power, but of excellent quality for heating purposes.

They have not yet decided where they will make this gas. Many people know that the East End Gas Company make their gas from coke ovens, but the process is not on so complete a scale as that intended to be used by Messrs. Smith & Markle, as the bi-products are not converted into gas. They have not yet decided whether they will utilize the waste of the Connellsville coke region, or establish a plant of from 1000 to 2000 coke ovens near this city. The question of the cost will decide the choice. The cost of laying a main to the Connellsville region would be great, but there may be other compensating advantages.

A market for 50,000,000 cubic feet of gas per day is assured in this city in the furnishing of fuel to over 900 puddling furnaces, 1000 steam boilers, 6000 houses and a large number of glass factories, some of which are already using gas as fuel, made by another process. The cost of fuel per day for a puddling furnace will be three dollars, for a battery of boilers one dollar, and for an ordinary dwelling house 10 cents.

The free gas, Mr. Smith says, will be accompanied by an odor that will discover any leak, and thus prevent accidents. While the word "steam" is used in giving the name of the company, Mr. Smith says it has nothing to do with the gas further than being used in the process of making it, so it will not conflict with another company applying for a right of way for steam circulation for motive power and heating.

But few people have ever taken the trouble to compute the sinful waste of fuel going on for years in the Connellsville coke regions. Accurate calculation has shown that every day 240,000,000 cubic feet of gas mingles with the atmosphere. This gas, at the apparently insignificant price of 10 cents per 1000 cubic feet, is worth $24,000, so that that much wealth is dissipated daily, or $8,760,000 per year. Thus, while a large portion of Western Pennsylvania is being rendered almost uninhabitable by clouds of smoke, the inhabitants may rejoice that what has heretofore been considered a nuisance can be converted into a blessing.

By coking the amount of slack that is daily thrown away by coal companies in the immediate vicinity many small towns near, by applying the process above mentioned, might be supplied with fuel, while the cost of making it could be gotten out of the coke, a product in demand almost all over the civilized world to-day. Enough gas is wasted at the Mt. Washington coke ovens daily to heat half the houses in the ward, but no one seems to have ever thought of utilizing it, although the Consolidated Company's success might have suggested the idea. It is said that the new venture will receive the support of most rolling mill owners and householders, and the time may again come when the housewife can have her wash dried in the back yard, as in days of yore.

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Superior Hand-Cut

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MADE FROM IMPORTED STEEL. EVERY FILE WARRANTED.

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H. Knickerbacker, Scythes, Axes and Tools.
H. W. Kipp, Nail Hammers.
Iron City Tool W'ks Ld, Vises, Picks, Mattocks, Grub Hoes, &c.
Jacobus & Nimick Mfg. Co., Locks, &c.
Sandusky Tool Co., Planes and Plane Irons.
Geo. M. Eddy & Co. Measuring Tapes.
Wheeling Hinge Co., Hinges and Wrought Butts.
Northwestern Horse Nail Co. Horse Nails.
A. G. Coes & Co., Coes' Genuine Screw Wrenches.
F. K. Silby, Emery Cloth.
Sedgwick Mfg. Co., Butter and Flour Triers, etc.
Ripley Mfg. Co., Mouse Traps.
Sam'l Loring, Plymouth Tack & Rivet Works.
Carr, Crawley & Devlin, Miscellaneous Hardware & Cast Butts.
J. Mallinson, Cast Steel Shears and Scissors.
Ketchem's Pat. Metallic Sieves.
W. D. Turner & Co., Geneva Hand Fluters.
American Screw Co., Gimlet Pointed Screws, &c.
Romer & Co., Brass Locks, &c.
P. Lowentraut, Compasses, Callipers, Dividers, &c.
Clark Bros. & Co., Carriage Bolts, &c.
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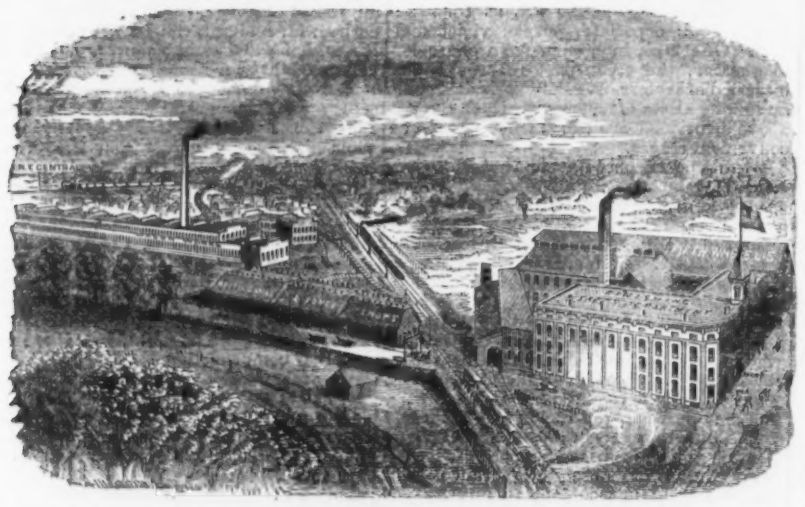

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Gang-Edger,
Ginsaw,
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Handsaw Taper, single cut,
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Handsaw Taper, slim,
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Hook-Tooth,
Knife,
Knife Blunt,
Lead Float,
Lightning,
Machine Mill,
Mill,
Mill Blunt,
Mill Pointing,
Pillar,
Pitsaw,
Reaper,
Roller,
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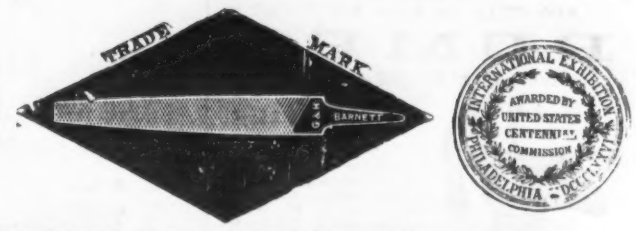

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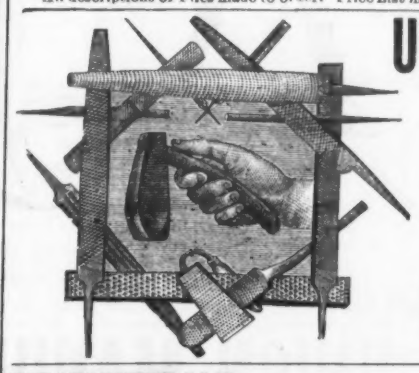

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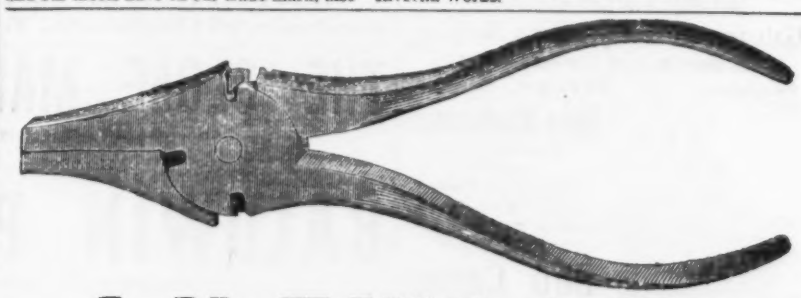

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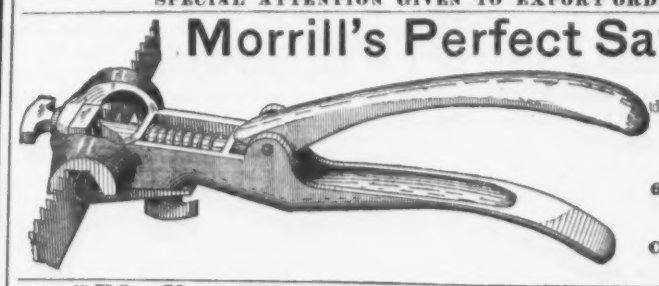

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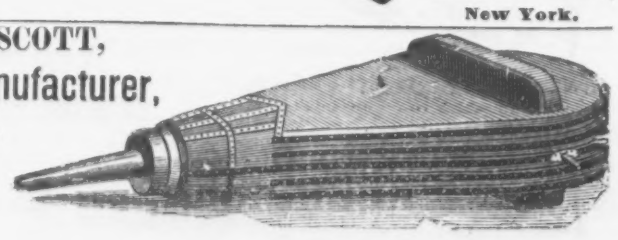

The New Trade Mark Law.

The following are the rules and regulations adopted by the United States Patent Office for the registration of trade-marks under the act of March 3, 1881:

WHO MAY OBTAIN REGISTRATION.

1. (a). Any person, firm or corporation domiciled in the United States or located in any foreign country which, by treaty, convention or law affords similar privileges to citizens of the United States, and who is entitled to the exclusive use of any trade-mark and uses the same in commerce with foreign nations or with Indian tribes. The following countries have treaties with the United States at this time, viz.: Russia, Belgium, France, Austria, the German Empire and Great Britain.

(b.) Any citizen or resident of this country wishing the protection of his trade-mark in any foreign country the laws of which require registration in the United States as a condition precedent.

STATUTORY REQUIREMENTS.

2. Every applicant for registration of a trade-mark must cause to be recorded in the Patent Office:

(a.) The name, domicile and place of business or location of the firm or corporation desiring the protection of the trade-mark, and the residence and citizenship of individual applicants.

(b.) The class of merchandise and the particular description of goods comprised in such class to which the trade-mark has been appropriated.

(c.) A description of the trade-mark itself, with *fac-similes* thereof, and the mode in which it has been applied and used.

(d.) The length of time during which the trade-mark has been used by the applicant on the class of goods described.

3. A fee of $25 is required on filing each application, except in the cases hereinafter named. (See paragraphs 16 and 17.)

THE APPLICATION.

4. An application for the registration of a trade-mark will consist of a statement and specification, a declaration or oath, and the *fac-simile*, with duplicates thereof.

5. These should be preceded by a brief letter of advice requesting registration and signed by the applicant.

6. The statement should announce the full name, citizenship, domicile, residence and place of business of the applicant (or, if the applicant be a corporation, under the laws of what State or nation incorporated), with a full and clear specification of the trade-mark, particularly discriminating between its essential and non-essential features. It should also state from what time the trade-mark has been used by the applicant, the class of merchandise, and the particular goods comprised in such class, to which the trade-mark is appropriated, and the manner in which the trade-mark has been applied to the goods.

7. The declaration should be in the form of an oath by the person or by a member of the firm or by an officer of the corporation making the application, to the effect that the party has, at the time of filing his application, a right to the use of the trade-mark described in the statement; that no other person, firm or corporation has a right to such use, either in the identical form or in such near resemblance thereto as might be calculated to deceive; that such trade-mark is used in lawful commerce with some foreign nation (or nations) or some Indian tribe (or tribes), and that it is truly represented in the *fac-simile* presented for registry.

8. This oath may be taken within the United States before a notary public, justice of the peace, or the judge or clerk of any court of record. In any foreign country it may be taken before the secretary of a legation or consular officer of the United States, or before any person duly qualified by the laws of the country to administer oaths, whose official character shall be certified by a representative of the United States having an official seal.

FAC-SIMILES TO BE FILED.

9. Where the trade-mark can be represented by a *fac-simlie* which conforms to the rules for drawings of mechanical patents, such a drawing may be furnished by applicant, and the additional copies will be produced by the photolithographic process at the expense of the office, or the applicant may furnish one *fac-simile* of the trade-mark, mounted on a card ten by fifteen inches in size, and ten additional copies upon flexible paper, not mounted; but in all cases the sheet containing the mounted *fac-simile* or the drawing must be signed by the applicant or his authorized attorney.

PROCEEDINGS IN THE OFFICE.

10. All applications for registration are considered in the first instance by the trade-mark examiner. An adverse decision by such examiner upon the applicant's right to registration will be reviewed by the Commissioner in person upon petition without fee.

11. No trade-mark will be registered unless it shall be made to appear that the same is used as such by the applicant in commerce with foreign nations or with Indian tribes, or is within the provisions of a treaty, convention or declaration with a foreign power, nor which is merely the name of the applicant, nor which is identical with a known or registered trade-mark owned by another and appropriated to the same class of merchandise, or which so nearly resembles some other person's lawful trade-mark as to be likely to cause confusion in the mind of the public or to deceive purchasers.

12. In case of conflicting applications for registration, or in any dispute as to the right to use which may arise between an applicant and a prior registrant, the office will declare an interference, in order that the parties may have opportunity to prove priority of adoption or right; and the proceedings on such interference will follow, as nearly as practicable, the practice in interferences upon applications for patents; but each applicant and registrant will be held to the date of adoption alleged in the statement filed with his application. On the petition of any party dissatisfied with the decision of the Examiner of Interferences the case will be reviewed by the Commissioner without fee.

13. When these requirements have been complied with and the office has adjudged the trade-mark lawfully registrable, a certificate will be issued by the Commissioner, under seal of the Interior Department, to the effect that applicant has complied with the law and that he is entitled to the protection of his trade-mark in such cases made and provided. Attached to the certificate will be a *fac-simile* of the trade-mark and a printed copy of the statement and declaration.

14. The protection for such trade-mark will remain in force for thirty years, and may, upon the payment of a second fee, be renewed for thirty years longer, except in cases where such trade-mark is claimed for and applied to articles not manufactured in this country, and in which it receives protection under the laws of any foreign country for shorter period, in which case it will cease to have force in this country, by virtue of the registration, at the same time that the trade-mark ceases to be exclusive property elsewhere.

15. The right to the use of any trade-mark as assignable by an instrument of writing, and such assignment of a registered trade-mark must be recorded in the Patent Office within sixty days after its execution, in default of which it shall be void as against any subsequent purchaser or mortgagee for a valuable consideration, without notice. No particular form of assignment or conveyance is prescribed, but the trade-mark should be identified by the certificate number.

16. Owners of trade-marks for which protection has been sought by registering them in the Patent Office under the act of July 8, 1870 (declared unconstitutional by the Supreme Court of the United States), may register the same for the same goods, without fee, on compliance with the foregoing requirements. With each application of this character a specific reference to the date and number of the former certificate is **required.**

17. Applicants whose cases were filed under the act of 1870, either prior to or since the decision of the Supreme Court declaring it unconstitutional, which are now pending before the office, are advised to prepare applications in conformity with the law and foregoing rules. On the receipt of such application, referring to the date of the one formerly filed, all fees paid thereon will be duly applied. Those who have paid only $10 as a first fee are advised that the law does not provide for a division of the legal fee of $25, and that the remainder of the entire fee is required before the application can be entertained.

COPIES AND PUBLICATIONS.

18. Printed copies of the statement and declaration in each case, with a duplicate of the trade-mark, can be furnished by the office. The *Official Gazette* of the Patent Office, published weekly, will contain a list of all trade-marks registered, with the name and address of the registrant, a brief statement of the essential features of the trade-mark and the particular description of goods to which it is applied.

FEES.

19. On filing an application for registration of trade-mark	$25.00
For recording assignments:	
Under 300 words	1.00
Over 300, and less than 1000 words	2.00
Over 1000 words	3.00
For single printed copy of statement and declaration	.05
Single copy *Official Gazette*	.10
Annual subscription *Official Gazette*	5.00

CORRESPONDENCE.

20. All letters should be addressed to "The Commissioner of Patents," and all remittances by postal order, check or draft should be to his order.

21. Letters relating to pending applications should refer to the name of the applicant and date of filing. Letters relating to registered trade-marks must refer to the name of registrant, number or date of certificate, and the class of merchandise to which the trade-mark is applied.

22. The office cannot undertake to respond to inquiries propounded with a view to ascertain whether certain trade-marks have been registered, or if so, to whom or for what goods; nor can it give advice as to the nature and extent of the protection afforded by the law or act as its expounder, except as questions may arise upon applications regularly filed. A copy of these rules, with this paragraph marked, will be regarded as a courteous answer to all such inquiries.

Barb Fencing Nails.—The Wareham Nail Company are turning out, in large quantities, a new nail intended for use in barb wire fencing, which will certainly meet with the approval of all who build this fence. The first nail of this kind was invented by a Mr. Smythe, who in 1875 took out a patent for it and commenced its manufacture. The nail, however, while giving great satisfaction to all who used it, was a malleable nail, and was too costly to compete with the common staple. Some time after this Mr. C. W. Dean, who was connected with the Wareham Nail Co., conceived the idea of cutting fencing nails of this kind the same as ordinary nails, and invented a method for cutting this nail from band or other iron practically without waste of material. The company took up the invention, perfected the machinery, and are now turning out the nail at a price which will, they believe, meet the price of the common staple. The nail receives the preference over the staple, as it is driven much more easily than the common staple, especially into hard wood.

For a long time the settlement of the well-known bankrupt estate of James T. and Charles A. Wood, Pittsburgh, has been delayed by the contending claims of two Philadelphia parties to a dividend of $8020.43. An injunction was obtained preventing the trustees from paying it out. Upon the motion of the trustees, the matter has been decided and the estate can now be closed. It is nearly eight years since the bankruptcy of these parties began. With this obstacle removed the money will be paid and the case finally settled.

A company has been formed in Paris, with a capital of 5,000,000 francs, to purchase and work the famous Krivoi-Rogg iron mines in Southern Russia.

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FRIEDMANN & LAUTERJUNG,

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PEN AND POCKET CUTLERY,

Solid Steel Scissors, Shears, Razors, &c.

Sole proprietors of the renowned full concave

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Agents for the BENGALL RAZORS.

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Superior Cutlery of all kinds and grades, from the finest in pearl and ivory handles to the lowest price in wood and iron handles.

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BUTCHERS' and HUNTERS' KNIVES

Are warranted to be equal in style, finish and quality, to any goods made in the world.

"COMPARE, THEN JUDGE."

We are the sole owners of the *Gardner Patent Guard and Rest for Carving Forks,* and the manufacture of fine carvers is with us a specialty.

AARON BURKINSHAW, Pepperell, Mass.,

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OF EVERY DESCRIPTION.

My Blades are forged by hand from the best cast steel and warranted. Established 1853.

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ALSO AT LEIPZIG, IN ACCORDANCE WITH THE GERMAN TRADE MARKS' REGISTRATION ACT

BUTCHERS' KNIVES,
BUTCHERS' STEELS,
AND
SHOE KNIVES.

It having come to the knowledge of JOHN WILSON that Counterfeit Butchers Knives, purporting to be of his manufacture, are being sold in the United States, he hereby cautions all purchasers of his Knives and Steels to be on the alert against such imposition.

JOHN WILSON also hereby gives Notice, that it is his determination to institute Legal Proceedings against any person or persons who may be detected infringing his Trade Mark.

Every article of JOHN WILSON'S manufacture, bears the Trade Mark, in addition to the Name.

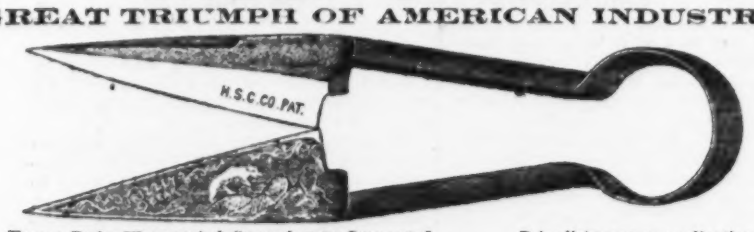
WORKS:—SYCAMORE ST., SHEFFIELD, ENGLAND. Established 1750.

SEYMOUR'S

Diamond Edge Solid Cast Steel

SHEEP SHEARS.

GREAT TRIUMPH OF AMERICAN INDUSTRY.



Every Pair Warranted Superior to Imported. Price lists sent on application.

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George A. Ruhleman & Co., St. Louis, Mo., have sold our Casters as follows:

1878	Amount,	$14.55
1879	"	246.76
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Our Caster is no experiment. The people will have it, if it does cost more than the shams on the market. Eight-inch Mill Files are no better stock. Introduce yourself to these goods by a very small stock order of our selection. Terms, 60 days. Ship them back if they fail in your esteem. Send for catalogue.

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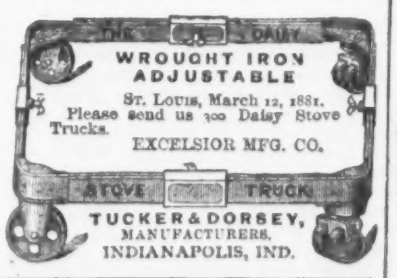
Our Drawer is so uniform, simple, strong and effective, that it has no equal. Driven all competition from the field.



The Northup Window Spring

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These shears are unsurpassed for cheapness, durability and utility. They are made of one solid piece of steel from point to point, and cannot be broken in use either in the bow or at the junction of the shank and blade. Samples can be seen at above address, or sample lots furnished.

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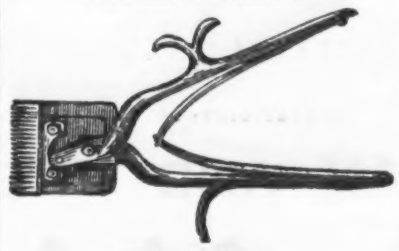

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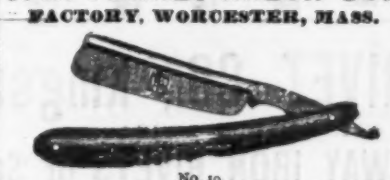

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Have no equal.

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Genuine Old Reliable,
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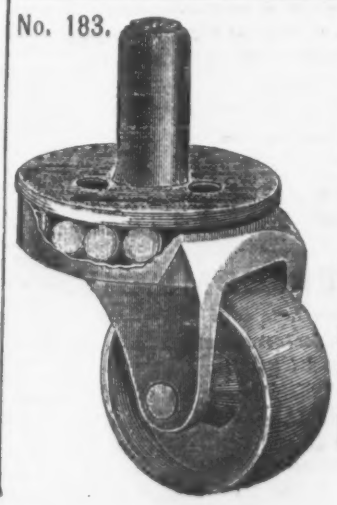

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Can Never Wear Out or Fail to Act.

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Has plates riveted firmly together, with opening for screw driver. Works upon iron disks or rollers concealed from view, which relieve all friction and strain upon the stem, by placing the weight directly over the main wheel. No oil used on rollers. Made in all sizes and styles by

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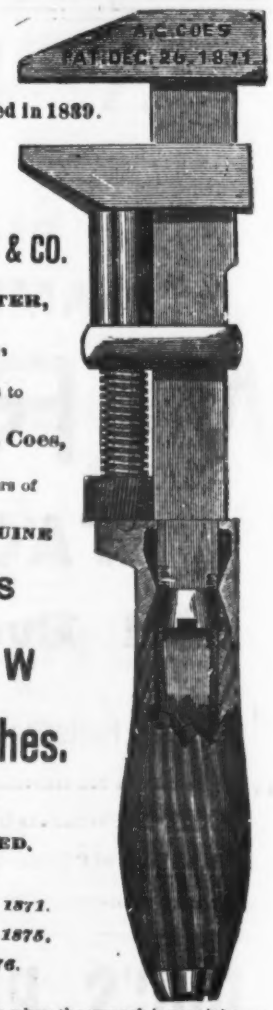

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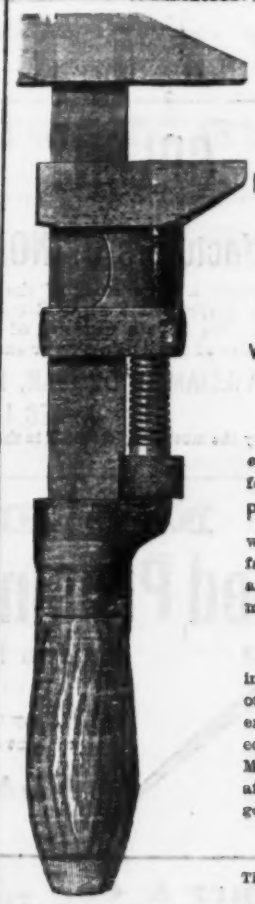

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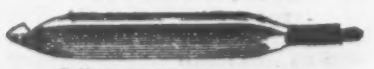

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Sir Henry Bessemer on Steel Making.

Sir Henry Bessemer has addressed the following letter to the editor of the *Ironmonger*, which will be read with much interest:

SIR: I observe in your journal of February 19 a letter signed "C. M.," in which the writer criticises some of the statements put forward in the paper which I read on December 4, and, although I have no desire to enter into any long controversy on this subject, I feel it necessary to correct some mistakes into which your correspondent appears to have fallen, from not having fully understood the grounds on which my opinions were based.

He says the heaviest charges I have made against our steel makers are contained in the following paragraph, viz.: "The simple truth is, disguise it as we may, that the art of steel making in Sheffield ever was, and is at this moment, so imperfect that, whatever known process is employed (of course, I include my own), impure steel results from the use of impure iron and high-class steel from high-class iron, and from that cause alone, and not from the skill of the manufacturer."

That this is a fact I am prepared to show by the most irrefragible proofs, afforded by the daily practice of the whole cast-steel trade of the world; for the want of scientific knowledge in this manufacture is so well known and so self-evident, as to distinguish it in a marked degree from the more highly developed manufacturing processes of the present day, and which want of scientific knowledge and skill will be at once apparent, when we draw a comparison between this manufacture and other metallurgical processes which are conducted on purely scientific principles.

Let us take the manufacture of copper as an example: Its chief ores are pyrites, consisting of sulphur, 37 parts; iron, 33 parts; and copper, 30 parts. Here, then, is a raw material of extreme impurity; but the chemical knowledge and skill of the copper manufacturer is such that chemically pure copper is eliminated from this great mass of impurity.

Another example is afforded in the separation of fine silver from the antimoniated red silver, which contains 14 parts of sulphur, 20 of antimony, 10 of oxygen and 56 of silver; and, notwithstanding the heterogeneous character of this compound, such is the skill with which it is refined that the resulting metal does not contain one part in 10,000 of either of these impurities.

Again, I may mention that some 40 years ago the manufacture of pure white lead was in much the same imperfect state as the steel manufacture is at the present day, for nearly all metallic lead contains from 3 to 10 ounces of silver per ton, and with this natural alloy the best white lead cannot be made. There happened, however, to be lead mines at Villach and Krems producing lead almost wholly free from silver, just as Sweden has mines from which iron is obtained almost wholly free from sulphur and phosphorus; hence Villach and Krems became celebrated all over the world, and had to be resorted to for pure Kremnitz white; and all this simply because our lead manufacturers had not the requisite knowledge and skill to remove this small quantity of silver from ordinary lead. Fortunately, however, Mr. Pattinson applied himself to this task, and succeeded, by his beautiful crystallizing process, in separating every trace of silver from lead; indeed, so perfect is the process that it pays commercially to treat lead that contains only 3 ounces of silver to the ton—say, one part in 10,000; hence all lead so treated is now capable of being converted into a pure white carbonate. Thus has the hand of science once more removed the insuperable barrier which the rule-of-thumb manufacturer had for ages believed that nature had eternally interposed. But this simple improvement now enables the British manufacturer of white lead to employ his own cheap native material, instead of relying on an expensive foreign producer, as our steel manufacturers still continue to do.

It is needless to multiply examples showing the absolute command which skilled metallurgists have over the various impurities associated with almost every metal in its crude state as reduced from the ore.

Now, it is a fact beyond question that the manufacturer of tool steel, if he had acquired sufficient scientific knowledge and practical skill to refine the raw material pig iron, and to perfectly remove some 5 per cent. only of impurity from it, there would remain 95 per cent. of pure iron available for his use. He could in that case purchase his raw material at £3. 10/ per ton, 95 per cent. of which is chemically pure iron, and therefore of a still higher quality than any of the famous iron bars of Danamora, for which as much as £36 per ton has been paid. Failing in all attempts to sufficiently refine the crude iron, he has fallen back on the use of bar iron. The puddler has succeeded in refining this crude iron to the extent of removing all of these impurities, less about one per cent., and in doing so he has brought up the price from £3. 10/ to £7 or £8 per ton. Thus, the tool-steel maker has before him a cheap bar iron which contains 99 per cent. of chemically pure iron, but this one part which is left in the hundred is by far too much for him to deal with in the present imperfectly developed state of the steel manufacture; and, although he adopts the term "cast-steel refiner" to designate his particular trade, he has never succeeded, during the 140 years that have elapsed since Huntsman invented the crucible process, in discovering any method whatever of purifying or refining the metal he employs, even to the extent of removing one-half of the one per cent. of impurities left in the native bar iron, and in the absence of the knowledge and skill necessary to so refine it, he has but one resource left, viz., to send over to a foreign country and purchase iron of the requisite purity at a cost amounting, in some cases, to £20 or £30 per ton, and thus makes himself but little more than the mixer and melter-up of the pure products of a foreign manufacturer. Surely no one who has to make such a terrible sacrifice in the purchase of his raw material, simply because he is unable in any way to refine the cheap native material at his command, and who is so wholly dependent on the foreign manufacturer for the quality of the steel he eventually turns out, can ever attempt to place such a manufacture upon a level with the many other metallurgical processes in daily use around him, where the very cheapest and most impure of raw materials that can be purchased are by scientific processes converted into commercial products of the most perfect purity.

There can be but one opinion in the mind of any unprejudiced person as to the fact of pig iron being the natural and proper raw material for the steel maker to employ as the basis of his operations, nor can the proposal to do so be treated as the idea of a man without practical knowledge, or as the dream of a mere enthusiast, for it has in reality been for many years an accomplished fact, and the year 1880 has witnessed the production of over 3,000,000 tons of Bessemer cast steel, made direct from pig iron smelted with coke; and in all this vast mass of material the processes of puddling, balling, squeezing, rolling, shearing, piling, reheating, rerolling, cementation with charcoal and crucible melting have been entirely omitted, with all their attendant labor, engine-power and fuel, and in every case the crude pig iron becomes an ingot of cast steel in the short space of 25 minutes, and in quantities varying from 5 tons to 10 tons in that short space of time, while the steel so produced is fully equal in quality to that which is made from British bar iron by the tedious and expensive crucible process.

I have no doubt that had the steel trade shown some intelligent appreciation of the future of this process when I first introduced it into Sheffield, and had applied it by degrees as it became developed to the many purposes for which it was admirably well adapted, it would long since have become a great and profitable branch of their staple manufacture; but in their wisdom they chose a policy of vigorous opposition and a persistent denial of its merits, such as they were, and have thus forced it into the hands of the great iron manufacturers—a circumstance most fortunate for myself and for the rest of the world.

Having now placed before your correspondent the reasons on which I based the assertion to which he so strongly objects, I most gladly turn to the other side of the question, and in doing so let me at once distinctly repeat that which I have on many occasions most freely acknowledged, viz., that steel of the very highest quality can be, and is, regularly produced in Sheffield by the crucible process, admirably adapted by its varied degrees of carburation for all the purposes to which steel can be applied, and which results have doubtless only been obtained after many careful observations, extending over a long series of years, and by the use of much valuable practical knowledge, slowly and laboriously acquired, and so accumulated as to form a code of rules known only to the initiated, and which has in years gone by taken the place, to a good extent, of that more direct and more valuable scientific knowledge which has raised some other metallurgical processes to so high a pitch of excellence.

It is difficult to estimate the enormous amount of trouble and uncertainty that would have been spared the steel maker had he long ago made himself, by strict analyses, accurately acquainted with the ever-varying quantities, and also the nature and properties of the several matters still present in the various brands of iron he daily employs, instead of assuming a special fixed quality in each brand, and formulating specific mixtures of them, based only on their reputed qualification.

I can readily understand how the steel maker of to-day, trained from his boyhood to look upon the process he daily employs and sees practiced by others, as the proper and only legitimate way of producing good steel, and having become initiated in the mysteries of an empyrical system, he sees in it an all-sufficient, if not a perfect, mode of operation, and feels surprised and indignant that others who have not fallen into the same groove, and have not been so trained, should view his operations from a totally different standpoint, and judge them by quite another standard. Although I shall ever entertain the strongest views as to the necessity of scientific investigation and scientific methods as the base of all manufacturing operations, I nevertheless fully admit how important a part is played by the purely practical man in the successful carrying out of all great manufacturing operations, and in the paper which your correspondent criticises I did full justice to the scientific advancement of Sheffield in the following passage, viz.: "And it is with great pleasure that I am enabled to bear witness to the rapid advance of science now taking place in the steel manufacture, more especially so since the establishment of the Iron and Steel Institute, which has shed a sort of electric light on the Egyptian darkness beneath which all knowledge of the chemical and physical condition of iron and steel were so deeply buried. Every well-ordered works has now its chemist and its laboratory, which are considered as essential to the success of the manufacture as the hammer and the furnace, while the time-honored rule of thumb is fast fading away and becoming a thing of the past."

Your correspondent asks, "What would be thought of the writer were he to say of a cutlery house of the first-class, 'Oh! you only make first-class razors, or spring knives, or table knives, because you use only first class steel!' Would he not be asked how else can he make first-class goods?" I fail entirely to see how this question applies to the point in discussion, because the business of the cutler is simply to fashion the steel supplied to him into different articles, without in any way altering the quality or composition of the metal; it is, therefore, obvious that he must be supplied with good steel if he is to make good cutlery; but it by no means follows that a "refiner" and maker of steel should be obliged to use in his trade a raw material so pure as to need no refining except that which had been accomplished by the iron manufacturer.

Again, your correspondent says: "I also venture to ask the same question in reference to steel making. What else can they do? There is no known process that will

give to common irons the qualities required to make first-class steel; so if they want this material they must use high-class irons."

This assertion of "C. M." is simply an admission and surrender of the whole case at issue. They have, he says, no known process whereby they can purify the impure raw material they employ, as in all other metallurgical operations; it is just this want of knowledge of any method of removing even one-half of 1 per cent. of impurity from a cheap bar, and so rendering it available for making the best steel, which constitutes the "imperfections" of the steel manufacture which I pointed out in my paper last December, and to which "C. M." so strongly objects; and now I find him almost adopting my very words, and stating emphatically, "if they want high-class steel they must employ high-class iron;" and, I may add, that so long as this necessity exists, the manufacture of steel will be hopelessly behind in the race with the other more scientific manufactures of this country.

Your correspondent says he thinks "that one or two short quotations will be sufficient to show that Sir Henry practically refutes his own charges." "He says Mr. Allen starts from the zero point of pure iron as No. 1, and advances to No. 20, for steel containing 1 per cent. of carbon, so that each grade is one-twentieth of 1 per cent. harder or softer than its next number. * * * No batch of five tons can differ from its standard quality more than one-fortieth of 1 per cent. Again I ask, Can the manufacture of Bessemer steel be fairly said to be so very imperfect when such nice results can be obtained with so much certainty?"

A very few words will suffice to show "C. M." that there is not the slightest contradiction involved in the statement he has quoted. Thus, if Mr. Allen were to convert ordinary Welsh pig iron, it would not make steel of a useful quality for any purpose: but if, instead of this, he takes hematite pig iron and converts it, he produces a steel admirably adapted for the manufacture of rails, axles, plates, wire and a vast number of other important purposes. And if he takes certain brands of Swedish pig iron and converts them, he at once produces steel as free from impurities as can be produced from the best Swedish iron bars by the more expensive crucible process; and so, in like manner, if he takes well-selected hematite pig, and mixes certain quantities of Swedish pig iron with it, he produces a quality of steel intermediate between ordinary Bessemer steel and crucible steel made by melting blistered Swedish bars, and which intermediate quality is now extensively used in lieu of crucible steel. Thus, as I stated in my paper, the Bessemer process, like other modes of making steel, is dependent on the quality of the raw material for the quality of the finished product.

But, notwithstanding this defect, it must be borne in mind that whatever brand, or mixture of brands, Mr. Allen converts, the large quantity operated upon at one time immensely assists in producing a uniformity of quality in the results obtained, while the degree of carburation or temper, ascertained in each case by a strict analysis, admits of the classification of each 5-ton batch with a degree of precision and certainty which the small crucible process, aided only by the judgment of the eye (in sorting the steel to be melted), can never hope to approach.

Yours truly, HENRY BESSEMER.
DENMARK HILL, February 26.

The Strongest of the Bronzes.

Prof. Robert R. Thurston, of the Stevens Institute of Technology, has contributed an important paper to the American Society of Civil Engineers, on a newly-discovered alloy of maximum strength. By an ingenious method of planning his research and recording the data obtained, he showed strikingly the remarkable variations of quality in various bronzes. He proved that the alloys of copper, tin and zinc of maximum strength are grouped about one not far from—copper, 55; zinc, 43; and tin, 2. Prof. Thurston made this alloy, finding that it was close-grained, of rich color, fine surface and capable of taking a fine polish. It oxidizes with difficulty, and the surface then takes on a pleasant shade of statuary bronze green. Testing it, it was found to have considerable hardness, but moderate ductility, though tough and ductile enough for most purposes. It would forge if handled skillfully and carefully, and not too long or too highly heated. It had immense strength, and seemed unusually well adapted for general use as a working quality of bronze. In composition, however, it is seen to be a brass, with a small dose of tin.

The alloy made, as representing the best alloy for purposes demanding toughness as well as strength, contains more tin than the above composition, having 55 of copper, 2.5 parts of tin, and 445 parts of zinc. It had a tenacity of 68,900 pounds per square inch of original section and 92,136 pounds on fractured area, and elongated 47 to 51 per cent., with a reduction to from 0.67 to 0.73 of its original diameter. The alloy was very homogeneous. The fractured surface was in color pinkish yellow, and was dotted with minute crystals of alloy produced by cooling too slowly. Prof. Thurston expresses the opinion that there should be no trouble in securing copper, tin and zinc alloys of tenacities between 75,000 and 100,000 pounds per square inch by intelligent and skillful working.

To San Francisco by a New Route.—The new route to San Francisco, by way of the Atchison, Topeka and Santa Fé and the Southern Pacific railroads, was to open for business on March 17. On the evening of that day the first passenger express train over the new route would start from Kansas City for Deming, New Mexico, where a connection with the Southern Pacific has just been completed. A similar train will leave Kansas City and Atchison every evening. These trains will include Pullman sleeping and drawing-room cars, which will be run as far as Deming. From that point the Southern Pacific will run its own sleepers and parlor cars. The time between New York and San Francisco by the new route will be the same as that made by way of the Union and Central Pacific roads. The distance by the former is about 300 miles greater than by the latter route, but it will be discounted by the absence of heavy grades and freedom from snow blockades. Owing to an arrangement between the several Pacific roads, the through fare will be the same by either route.

On the Elasticity of Wire.

Mr. J. J. Bottomley has published the results of a series of experiments made on the elasticity of wire. Using a continuous arrangement for applying the stretching weight and employing some very soft iron wire which had been specially prepared, and which was used in former experiments, the greatest weight which could be rapidly put on the wire without breaking it was determined. It was found that with a weight of 41 pounds gradually applied in 6¼ minutes, the wire stretched by 24.4 per cent. of its original length, and broke 18 minutes after the weight was put on. With the same weight, 41 pounds, applied in 6¾ minutes, the wire stretched 22.1 per cent. and broke in 24 minutes. With 41 pounds, however, applied in 7¼ minutes, the wire stretched 18 per cent. and did not break. This weight, therefore, appeared to be just as much as the wire would bear with this method of applying the weight. Accordingly it was applied to a great number of wires for different lengths of time, for the purpose of hardening them, and arrangements have been made for keeping a number of wires for very long times with this stretching force applied to them. The amount of extension produced by the application of the hardening stress was observed in each case.

After the hardening stress had been applied for a certain time the additional weight necessary to break the wire was determined, and also the additional elongation before breaking, which was in all cases almost insensible. The wires seemed permanently set in about 40 minutes from the time when the hardening stress was applied. They did not alter in length till just before they broke, when they generally stretched 0.04 to 0.08 inch on a length of about 70.8 inches. The following table shows some of the results out of a great many that have already been obtained, the length of the wire being 59 inches, and the hardening stress applied, 41 pounds. The time given in the first column is that taken by the continuous machine in applying the hardening stress:

Time, minutes.	Extension per cent. in original length.	Duration of hardening stress in hours.	Total breaking weight after hardening.
6¼	24.4	Broke with 41 pounds.	
6¾	22.1		
9½	18.7	24	47.44
7	17.9	97	47.5
8	17.3	117	48.13
7¼	18.1	790	52.31

Hot Water in Anthracite Mines.—The Reading *Times* says: The borough of Shenandoah, Schuylkill County, is greatly excited over the presence of hot water in one of its seven coal mines, and apprehensions are entertained that the colliery is on fire. As a precautionary measure, a watch is constantly kept in the lowest lift for any sign of fire, but up to the present, with the exception of the warm water, no cause for alarm has been discovered. The foreman of the colliery stated that he never knew water, found under the circumstances above stated, to have been heated except by fire. Several experienced miners who have visited the mine state their unbelief in the existence of a fire, but can give no satisfactory reason for the presence of the heated water. Warm water has of late been found in one of the workings of Turkey Run Colliery also. This colliery is located at the southeastern boundary of the town and west of Shenandoah Colliery. The workings are unconnected. Turkey Run is also operated by the Philadelphia and Reading Coal and Iron Company. The officials at this colliery are just as much in the dark relative to the cause of the strange presence as are those at Shenandoah Colliery. A solution of the mystery is anxiously awaited at Shenandoah, and may be expected in a week or ten days.

An international exhibition is to be held at Altona, Germany, from the 18th of August until the 18th of September of the present year. It is intended to embrace power machinery of various classes, woodworking machinery, and tools for metal workers, tinsmiths, watch makers, jewellers, tanners, saddlers, shoe makers, hatters, bakers, butchers, painters, &c., together with any special machinery required in those trades. The articles made will also be exhibited, and a special feature is to be a show of dairy machines and implements. The close vicinity of Altona to Hamburg and to the rich and populous districts of Holstein and Mecklenburg, will no doubt add much to assure success. We are informed that the Hamburg Steamship Line have offered to transport back to New York, free of cost, any goods exhibited by Americans. A very favorable opportunity is thus offered to bring to the notice of an important section of Germany our ingenious labor-saving tools and machinery.

The United States is liable to earn for itself the reputation of making infernal machines for use in Europe. It will be remembered that some years ago an explosive apparatus intended for a Bremen steamer, exploded on the dock at Bremen, causing great loss of life. The origin of the machine was traced to somebody hailing from New York. Now again two experts in this city, one a maker of clock-work devices, and the other of electrical apparatus, voluntarily acknowledge that they probably made the explosive machine which was exploded in the late Czar's Winter Palace a few months ago. A certain "Mr. Prescott," who was overheard to speak in the Russian language, and wanted something to ignite "Greek fire," is supposed to be the one who arranged for this diabolical device. But perhaps after all the story is a cheap advertising dodge.

The Iron Age

AND

Metallurgical Review.

New York, Thursday, March 24, 1881.

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CONTENTS.

It is stated that Democratic Senators and Representatives have sent, under their franks, 25,000 copies of Judge Kelley's speech, in reply to Mr. Hurd's free-trade resolution, into the South. This is a most hopeful sign for protection in this section of the country, whose traditions are so largely in favor of free trade. It also shows that it is becoming alive to its industrial interests, and purposes to take measures to foster and encourage them. Indeed, it is an open secret that some of the ablest Southern champions of free trade made pledges to the protectionists of their districts, previous to the last election, of future aid to tariff measures, especially those favoring iron.

The Liability of Railroads for Detention of Freights.

Some time ago a manufacturer doing business in Newark, New Jersey, shipped a carload of merchandise by one of the trunk lines to a town in Illinois. The shipment consisted of a new article of manufacture which he was then introducing with some little difficulty. Two salesmen were working together to introduce it, and they had sold in the town to which the goods were sent about a carload. Their presence was needed to distribute the goods and collect payment, and they were ordered to remain there until the goods arrived—the expense of keeping them idle averaging about $12 per day. The carload should have reached them within six or eight days from the date of shipment; the goods were not delivered for eight weeks. The shipper lost the time and expenses of the two men, and, owing to the delay, all the orders were countermanded. Daily application was made to the railroad company for information about the car, and daily they promised to look it up. Finally the manufacturer's agent started down the line to look for it himself, and found it some six miles from its destination on a siding, forgotten and in nobody's charge. No one could say when it came or when it would be forwarded; and it was not until the railroad company was told where the car was that they forwarded it to its destination. The manufacturer immediately brought suit for the full amount of damage he had sustained in pocket and business reputation from the unreasonable detention of his goods in transit, and has written us for information as to the extent of the company's liability. As thousands have suffered in the same way, and the question raised is one of much interest to the business community, it properly claims some attention at our hands.

What is known in law language as "an act of God"—such, for example, as an extraordinary storm, a snow blockade, or an unavoidable accident—is something for which a railroad company is not responsible, and when "due diligence" can be shown, even a long delay does not give the shipper grounds for a suit for damages. But for all delays or losses resulting from a lack of what the courts would hold to be due diligence, we think they are responsible. In questions of railroad law Redfield is good authority. He says the general principle that the carrier's responsibility continues throughout the *transitus*, in all modes of transportation, is unquestionable. Delivery to the consignee must be according to the course of business, &c. (§ 126) * * * But a delivery or tender of the goods must be in a reasonable time, the place and manner of which the jury must be the judges. What is "reasonable" is a question of fact, depending on the circumstances of the case. In the absence of special contract (§ 302) the carrier is bound to perform his duty, *i. e.*, deliver the goods at their destination, or at the end of the route to the next carrier, in a reasonable time, according to the usual course of business and with all convenient dispatch. But if the carrier (§ 303), being a railroad company, make no special contract to deliver in any particular time, and a delay happens in trains, in consequence of the unusual press of business, the company having a reasonable equipment for ordinary purposes, and the goods being carried with as much expedition as is practicable under the circumstances, the company are not liable for damages (Wabash *vs.* New York and Erie, 19 Barb., 36; S. C., 2 Kernan, 245). In this case it is said the measure of damages is not necessarily the difference in price at the time it should have been delivered and that at which it was delivered (Galena and Chicago Railroad *vs.* Rae, 18 Ill., 488). In an action against a carrier for damage done to goods carried (§ 307), it is enough to prove the good condition of the goods when put into his possession and their deteriorated state when received from him.

In the foregoing we think we have quoted enough from decisions and precedents in law to make out a good case for the plaintiff in the suit just begun, who has suffered from negligence in railway transportation. It was long ago settled that the responsibility of common carriers results not from any contract or from any implied undertaking or understanding between the parties, but from the nature of the business. The simple act of receiving the goods for transportation carries with it responsibility as a common carrier, and there can be no good claim for exemption from the full measure of responsibility for care and diligence on the ground that no special contract was made. The manufacturer who finds himself defeated in a laudable business enterprise is clearly entitled to damages. The goods shipped were not delivered in a "reasonable time," or with "convenient dispatch," or with "as much expedition as was practicable under the circumstances." The amount which he is entitled to recover is a question for the jury.

We have several times referred to the enormous traffic out of Pittsburgh and down the Ohio River, and of the small appreciation of the magnitude of this traffic by the country at large. An example of the character of this traffic has just been given. A few days ago a steamboat passed southward carrying 6000 tons of miscellaneous freight. No ocean steamer ever cleared from a home or foreign port with anything like this amount of freight. It rarely occurs to people that, under the Ohio River system of towage, the tonnage of a single steamer is sometimes greater than that of the largest-sized ocean vessels.

Arbitration in the English Iron Trade.

The annual report of the "Board of Arbitration and Conciliation for the North of England Iron Trade," which is just at hand, shows that this method of settling disputes is not only holding its own in those trades in which it has been tried in England, but is recovering from the temporary disuse into which it had fallen for a time. As is well known, this trade is a very large one, and the board, which is organized from the employers and employed in the rolling mills, has been in existence since 1859, and now regulates the wages paid on an output of 500,000 tons. The report shows that 18 works were connected with the board the first of this year, against 12 the first of 1880, and that 9079 operatives subscribed to the board—an increase of 3432 over the number reported last year. The receipts were £1640. 13/9, and the expenditure £948. 8/1, and the balance to the credit of the board £1114. 2/6. The wages during the year have been regulated by an agreement made December 22, 1879, and by a two years' sliding scale, which went into operation May 1, 1880. In addition to this, Mr. David Dale arbitrated a demand for the renewal of a reduction of 7½ per cent., made October, 1879, in the wages of the higher paid classes of skilled labor in plate and sheet mills, and numerous cases were settled at individual works, the points at issue being such as cinder burning, price for puddling in patent furnace, pay of shearers' helper, pay for busheling, &c.

In the constitution and action of this board there is one important feature that it would be well for our manufacturers to note. The board does not by any means include all of the iron mills in the North of England, nor all of the employees, and yet it regulates the wages of them all. In other words, a portion of the mills and operatives, acting in harmony and according to judgment, not passion, controls the wages of this vast district.

A second feature is the slight expense. The total cost of this system is a fraction over two shillings for each man who was a member December 31, 1880, or, as the works pay as much as the men, this would reduce the actual expense to a little over one shilling per man per year. Compare this with the expense of a strike. A strike that lasted two hours would cause as great a loss to the men and works as this board—which for more than ten years has prevented all general strikes—costs per year to each man and works. We do not see, with such facts before them, how the rolling mills of this country can refuse longer to adopt this principle.

Some Characteristic British Impertinence.

We have received from some friend in England a marked copy of "The *Daily* "*Gazette* for Middlesborough, Stockton, "Hartlepool, Darlington, Whitby and "Cleveland," in which we find reports of the speeches made at the recent dinner of the Cleveland Iron Trade Foremen's Association; also an editorial, from which we quote the following editorial comment on the speech of the chairman, Mr. Councillor Hanson:

Putting the United States "make" of pig iron at 3,300,000, he estimated that the men employed in all branches of its production numbered 45,000. Taking the usual average of five to a family, he reckoned that about 225,000 persons were dependent in that country on this trade. And the net outcome was thus pithily summed up: "According to the last census returns, the population of America was fixed at nearly 51,000,000—an increase of something like 12,000,000 in ten years; so that 50,800,000 people were willing to pay very nearly double what they otherwise need pay for the articles which were made from pig iron in order to keep furnaces going for the employment of 45,000 men, and in order to benefit the Pennsylvania manufacturer and the New York millionaire." Again, "America, in making its 6500 miles of railway, used 700,000 tons of rails, and paid £5 18s. 8d. per ton more than was necessary." Here are two nuts for *The Iron Age* to crack—facts which our able and audacious Protectionist contemporary would scarcely dare to reproduce in its columns. As Mr. Hanson remarked, it is an eminently hopeful sign to find a band of earnest and distinguished Free Traders publicly intimating their determination to expose this selfish, rotten and ruinous system. As a distinguished American professor declared last year, the time is not far distant when the people will open their eyes and arise in their might to smite their oppressors. They have only to be instructed. As soon as the millions of industrious agriculturists discover that they are paying cent. per cent. more than is necessary for every article of iron they use, simply to pamper a small tyrannical "ring," they will turn on the spoilers and shatter their nefarious combinations. Notwithstanding the enormous native output, at this very moment there is in the United States a demand for Scotch and English iron and for steel rails—that is to say, we in Cleveland can produce an article required, pay a premium in rates and tariffs nearly equal to the original cost, and compete in their own markets with the American makers. Only a compact, powerful and unscrupulous combination could make this possible in a new and partially-informed country—among a people who are blinded by a specious cry of "developing home industries," and mercilessly manipulated by a political machinery which misses no expedient, however objectionable, that will serve the one end of self-aggrandizement. The end of all this will come, as we have often said; it may be more speedily and decisively than those who fail to watch closely the current of events would venture to anticipate.

We do not like this way of being invited to a discussion, but, considering what our English contemporary thinks of the average of American intelligence and education, we are not surprised that he adopts this method of attracting the attention of an American newspaper.

It is the sheerest egotism on the part of the editor of our English contemporary, the geographically much distributed *Daily Gazette*, to suppose that *The Iron Age* or any other American newspaper is afraid to print such harmless nonsense as that above quoted. The "two nuts" offered us have worms in them, and, moreover, identically similar nuts have been cracked so often and the meat picked out of them so completely, that we do not think it worth our while to waste space or time over them. Such a description of the American system of economic legislation as that given by Mr. Hanson, can only be characterized as a gratuitous impertinence, in view of the fact that within a few months this nation has pronounced its faith in protection in a very emphatic and unmistakable way, and that in no country in the world is the science of political economy so much a popular study, or so intelligently understood by the masses, as here. And now, having gratified our English contemporary by reprinting its "two nuts," we will decline discussion, for the reason that the person who wrote the article to which we are asked to reply probably lacks the intelligence to understand what we might say on the subject, and that it is a matter of perfect indifference to us and our readers what was said respecting American affairs at the dinner of the Cleveland Iron Trade Foremen's Association, or what the *Gazette* thinks of it.

Pork and Foreign Exchanges.

The latest statistical comparison of exports and imports shows a magnificent balance in favor of the United States, and gold from the Bank of England continues to flow Westward. But the advancing prices of grain in this market are unfavorable to heavy shipments for Europe, and we shall soon feel the interdict against American pork fulminated by several foreign governments. It has already been shown that the statements, mainly originating with the British Consul in Philadelphia, respecting the alleged diseased condition of American pork, are gross misrepresentations. This is proven by inquiries instituted by commercial bodies in New York respecting the sources of information on which Mr. Crump based his statements, as well as from his own attempted self-vindication, which utterly fails. The interests affected, however, are of such a magnitude, and have such an important bearing upon international trade, as to call for immediate instructions from the Secretary of State at Washington to our Ministers at foreign courts as to the course which they shall pursue. Accordingly Mr. Lowell, at London, and Mr. Noyes, at Paris, will use their influence in exposing the errors which have been made, and so far as possible correcting false impressions. The communication telegraphed to Mr. Noyes is in the following terms:

WASHINGTON, March 16, 1881.

Noyes, Minister, Paris.—Your course respecting pork decree of French government approved. Statements of Crump, acting British Consul at Philadelphia, have occasioned excitement and widespread comment here, leading to correspondence with British Legation and Boards of Trade. Hog cholera is confounded with trichinosis, which is entirely a distinct disease. But representations regarding hog cholera are very greatly exaggerated. Most searching investigation fails to show the basis for published statements. The mortality among very young swine from cholera has been less this year than for several years past, and the condition of full-grown hogs, which are alone used for packing and export, is this year exceptionally good. British representative at Philadelphia has apparently been misled by designing speculators, to the great injury of legitimate trade. Deny in strongest terms the report of British Consul, should French Ministers appeal to it as justifying them in interdicting or restricting American pork trade. Instructions follow.

BLAINE, Secretary.

The truth of this matter can be simply stated in a few words. The only foundation for the false statements which have gained such wide currency is found in two undeniable facts, [viz., that shipments of old pork, which has remained in store ever since the great "corner" of one year ago, have found their way to foreign markets. Some of this pork, doubtless, was in the first stages of decomposition, and utterly unfit for food. Again, it has been made notorious that a very considerable mortality takes place among young swine, the disease resembling what is known as "cholera infantum" among children, but for the year past swine have been unusually healthy. The mischief arises from trumpeting abroad a fact with which all in the trade have been familiar for many years, and accompanying this single fact with gross exaggerations. This is the whole story. The embellishments in which designing operators indulge, such as the rare parasitic affection termed "trichinosis," are altogether imaginary and thrown in for the accomplishment of a purpose.

Dakota, which will soon be knocking for admission into the Union, is great in territory and resources. "Its magnitude will be 'appreciated," said Gov. Ordway in a recent conversation, "when you think of "journeying from Washington to the White "Mountains of New Hampshire without "getting beyond the territorial limits." The proposition entertained by the Governor is to make a State of Southeastern Dakota, which will have before the end of the present Congress from 125,000 to 150,000 inhabitants, and then create a territory north of the forty-sixth parallel and another territory west of the Missouri River. The finished railroads comprise 1200 miles, and 50,000 new settlers are expected the present year.

Domestic Export of Colonial Countries.

The Bureau of Statistics at Washington has just published details of our domestic export to countries south of us, and to Asia, Australasia and the Sandwich Islands during the fiscal year 1880. We have extracted therefrom metal goods, and compressed them with other merchandize, for the two last fiscal years, the figures being, in thousands of dollars, as follows:

EXPORT OF DOMESTIC GOODS.

Fiscal Year.	1879 Metal goods.	1879 Other goods.	1880 Metal goods.	1880 Other goods.
Mexico	1,152	3,288	1,094	4,072
Central America	78	1,033	197	1,532
British Honduras	....	294	20	350
Cuba	1,683	10,519	1,990	9,626
British West Indies	96	6,389	114	6,736
Hayti	33	3,126	89	3,522
Porto Rico	145	1,626	120	1,859
French West Indies	....	1,466	....	1,800
Danish West Indies	98	559	....	669
St. Domingo	62	667	216	724
Dutch West Indies	....	622	26	811
Brazil	540	7,567	896	7,671
Colombia	1,090	4,170	1,641	3,588
Venezuela	127	1,800	129	2,140
Arg. Republic	124	1,909	136	1,644
Peru	950	1,044	141	767
Uruguay	43	835	52	829
British Guiana	....	1,720	....	1,723
Chili	170	1,084	196	772
Dutch Guiana	....	167	7	247
French Guiana	....	70	....	76
American countries	5,611	50,185	6,272	52,078
China	43	2,609	60	1,041
Hong Kong	987	2,892	751	2,122
British East Indies	....	1,142	....	2,218
Japan	52	2,623	238	2,268
Australasia	1,506	5,537	979	3 708
Sandwich Islands	362	1,736	359	1,634
Total	8,761	66,124	8,672	65,069

The table shows that we exported during the fiscal year ended June, 1880, to South America, &c., $58,350,000 worth of goods, against $55,796,000 the previous year, of which $6,272,000 were metal goods, against $5,611,000 in 1879. On the other hand, the domestic merchandise export to Asiatic, &c., countries declined from $19,079,000 to $15,391,000, metal goods alone falling from $3,150,000 to $2,400,000. In this manner the total domestic export in that direction declined from $74,875,000 to $73,741,000. The chief decline, it will be seen, has been in our export to Australasia. China and Hong Kong also fell off, in consequence of the diminished quicksilver export. Our export to the countries South of us, it will be observed, develops normally, showing a decided improvement in the case of Mexico and Colombia, the latter in part due to the purchase of war material. The movement, taken as a whole, is all that could be expected, considering the advance in goods in this country, which has held out less inducement to purchase here.

An Elementary Lesson in Ethics.

In the column of the *Labor Tribune* which is understood to be controlled by the Amalgamated Association, we find the following:

The Iron Age, in its issue of March 10, seems to gloat over the conviction of D. R. Jones, miners' secretary, of conspiracy, with evidently as much relish as a bloodhound who had succeeded in catching its man. It's natural, however, for the capitalistic press to glory over anything that has for its object the downing of workingmen. Will *The Iron Age* please lay down rules for the government of workingmen, and we will adopt them.

If we thought that mechanics would follow any rules, we should be very glad to assist them in getting up a good code. These would be based on the following simple and easily understood propositions:

Every man's rights end where another's rights begin.

Every man has the inalienable right to sell his services for what he considers them worth, and no man has any right to abridge his liberty in this matter.

Employers have rights as well as workingmen.

No man has a right to conspire with others to do an employer injury.

This is a free country, and freedom means liberty within the limits imposed by a due respect for the rights of others, for moral obligations and for the law.

Men who live by fomenting strife between workmen and employers are public nuisances.

The best interests of capital are the best interests of labor.

If intelligent workmen would keep these simple and obvious truisms steadily in view, they would be able to get up their own rules without any help from us. In conclusion, we would remind the Amalgamated Association that misrepresentation and insult never helped any cause, nor won for it the respect of any one whose good will was worth having. Jones violated the law, was fairly tried for his offense and is now paying the penalty. That is all there is of it; and if any one has occasion to rejoice it is the workmen, who, during the time in which he is deprived of his liberty, are free from the attentions of a mischievous agent of strife and contention.

Complaints of the backward condition of trade, heard in many quarters in this city, are partly accounted for by the snow blockade in the Northwest, following closely the floods in the cotton States. Accounts from Illinois speak of snow-bound trains and depots filled with merchandise long awaiting transportation. Freight from that point for the Northwest is no longer received.

Heating Gas.

Dr. C. William Siemens, whose achievements in many branches of industry and of science are so well known, has recently come forward as an ardent advocate of heating gas. The subject is one which has attracted much attention in this country, and it has been repeatedly and seriously proposed to substitute gas, made in a large establishment and distributed like illuminating gas, for the solid fuel used in stoves and ranges for domestic purposes. On the score of convenience and greater cleanliness the advantages of the system will be at once conceded, and the estimates of cost presented are very encouraging. Dr. Siemens' plans differ somewhat from those brought forward in this country. The first contemplates the use of a portion of the products of the ordinary coal gas manufacture. He proposes to turn the gases emitted from the retort when first charged, into the heating mains, because they are of low illuminating power. After half an hour, richer products are obtained, and they are to be used for lighting. The last portions of the process of distillation are also to be turned into account as heating gas. He thus hopes not only to obtain the latter, but also to increase the quality of the illuminating gas. A second proposal made by Dr. Siemens looks to the conversion of coal into carbonic oxide by means of a gas producer, and by employing high temperatures in the latter he expects to be able to convert all the hydrocarbons of the coal into permanent combustible gases. How far these plans will bear the exacting tests of working on a large scale, it is, of course, difficult to predict, but the growing application of gas as a fuel for metallurgical purposes, for generating steam, &c., and the experience obtained with it, is encouraging. It is not supposed, in view of difference in the nature and cost of raw materials, that Dr. Siemens' plans will be able to compete with the American methods alluded to. It is, however, a very encouraging indication of the drift which the thoughts of eminent and practical men are taking to find Dr. Siemens an advocate of heating gas. In our Eastern cities one great advantage of the introduction of such a system of supplying residences with fuel in the shape of gas—the prevention of smoke—would not affect the question much, but in the West it would prove a very potent inducement to effect a change. It is not too much to say that the substitution of heating gas for solid fuel is not alone one of the possibilities, but appears to be one of the probabilities, of the future.

A preliminary meeting of considerable importance was held in the rooms of the Western Iron Association, Pittsburgh, last week. It was a convention of the manufacturers of sheet iron, to take action regarding the ruling of the Treasury Department on tin plate. This ruling has been so often referred to that we need only say that the decision admits tin plates at the rate that it was intended to admit tin *for* plates; or in other words, it admits the finished product at the rate it was intended to admit the raw material for that product, which is not produced in this country. The meeting decided to use every effort to secure such a wording of the law as would make tin plates chargeable with the proper duty, and so enable the manufacture to be begun here. The amount of tin plate used in this country is very large. In 1880, 158,000 gross tons, valued at $16,518,113, were imported into this country, and it is estimated that this represents the labor of 50,000 men constantly and consumes 250,000 tons of pig. It is also stated that the tariff on tin plate being less than on sheet iron, and thereby brought in cheaper, tin plate is used for many purposes that sheet iron might be. It is well known that two attempts have recently been made in this country to establish the manufacture of tin plate, one at Leechburgh, and the other at Demmler, both near Pittsburgh, but both have ceased its manufacture. If the duty was put at the rate the law intended, these works could not only run, but many others would be started.

The new Chilian Minister to the United States, Marcial Martinez, says the election of a provisional president for Peru was the last hope of the Republic. He cannot predict the result of the new election, nor whether Chili would recognize the officers who may be chosen, and treat with them for terms of peace.

In a lecture delivered at Glasgow, at the Naval and Marine Exhibition, Mr. William Pearce stated some very remarkable facts regarding the economy and speed secured in steam navigation during the past 25 years. The first steamers of the Cunard Company, established in 1840, were under contract to go 8½ knots per hour, indicating 740 horse-power, and consuming 4.7 pounds of coal per horse-power. The Persia, built in 1856, had side-lever engines indicating 3600 horse-power, and consuming 3.7 pounds of coal per horse-power. The Gallia, built in 1879, was fitted with compound engines indicating 5000 horse-power, and had a speed of 15½ knots. The Persia was able to carry only 250 tons weight of goods, or 800 tons measurement of light goods. The Gallia carried 1700 tons weight, or 2000 tons measurement. The Persia burned 6½ tons of coal for every ton of cargo she carried, while the Gallia burned less than half a ton, and carried her cargo 2½ knots an hour faster. The Arizona, indicating 6000 horse-power, consumed 1¾ pounds of coal per indicated horse-power, and carried 3400 tons weight of cargo at an average speed of 16¼ knots per hour. She thus burned less than 4 cwts. of coal per ton of cargo, at a speed across the Atlantic faster than any yet recorded.

WASHINGTON NOTES.

(*From Our Own Correspondent.*)

WASHINGTON, D. C., March 23, 1881.

THE POSSIBILITY OF AN EXTRA SESSION.

The extra session question has already been a matter of considerable discussion in and out of the Cabinet, and still no decision has been reached. As far as can be learned, the persons who favor an extra session are the friends of a few individuals who wish to oust the Democrats who are now holding the offices of the House of Representatives, and the Washington hotels, boarding-houses, and shopkeepers, who do not regard eight months of adjournment with a very lively anticipation of busy times.

A financial exhibit, prepared for the Secretary of the Treasury, and submitted by him to the Cabinet yesterday, demonstrated that the work of funding at a lower rate could be carried on by calling on the maturing sixes and issuing the 104,000,000 four and one-half per cents., and that no extra session is necessary. Although the general impression is that there will be an extra session, it is very doubtful whether the President will hazard the quiet of these early months of his administration by convening Congress before the regular day fixed for that purpose. Should Congress be convened, it could not, under the most favorable circumstances, get away before midsummer and accomplish any of the important business assigned to it.

ACTIVITY OF THE FREE TRADERS.

According to letters received by free-trade Democrats of the House of Representatives who are in the city, the promoters of the war against home industries are making vigorous efforts to get up an organization throughout the country, with a central administrative authority either here or in New York city. The systematic efforts being made by these parties have suggested to many persons familiar with the intrigues which have been carried on for many years in the interest of foreign manufacturers, that some other agencies than mere devotion to what is called principle are at work to stimulate this unusual and determined activity. It is also a notorious fact that those who bawl loudest are those who have been bounced out of office, and relegated to private life by the discrimination and mighty voice of the people.

The object of all this stir is, of course, to bring a decided pressure upon Congress to extend the free list. Under present circumstances it is not likely to terminate successfully, but the pressure is sufficient to keep up the agitation and to disturb business. The clubs which it is proposed to establish at different important centers in the United States, it is stated, will be in correspondence with the notorious Cobden Club, of London. The dissemination of free-trade literature, it is believed, will, in the end, have a beneficial effect in bringing about a free discussion of the question. There seems to be no doubt what the position of the people would be on such an issue after a full ventilation of the subject on both sides.

NEW PUBLICATIONS.

THE MINERAL RESOURCES OF THE HOCKING VALLEY By T. Sterry Hunt, LL. D. Published by S. E. Cassino, Boston, Mass. Price, 75 cents.

Dr. Hunt, who, in 1874, published a report on the coal and iron resources of the Hocking Valley, Ohio, has again come forward with a more elaborate pamphlet on the same subject. The excitement which carried away many prudent men in the early history of this region has subsided, and a calmer survey of its capacity, notably as an iron producing region, has modified many extravagant estimates. Until now, the growth of the iron industry of the district has been a rapid one, notwithstanding the fact that in its early days it struggled against many disadvantages. According to the tables recently published by Mr. James M. Swank, the furnaces of the Hocking Valley (now 14 in number) produced in 1875, 1250 net tons; in 1876, 7483 tons; in 1877, 23,895 tons; in 1878, 65,690 tons; in 1879, 51,908 tons, and in 1880, 85,719 tons, thus eclipsing its older neighbor, the Hanging Rock region, as far as the coke furnaces of that region are concerned. Dr. Hunt's account of the coal deposits of the new region is full and satisfactory; his description of the iron-ore deposits, however, is far from being such as to dispel all doubts as to the question whether they are regular and abundant enough to meet the sustained demands of a large and growing industry. Dr. Hunt gives many analyses of the ores and numerous facts as to their geological position, the cost of mining, &c., but he does not, in any part of his work, speak emphatically or decisively on the probability of a large future ore supply, beyond repeating former statements to that effect. We shall return to this subject at an early date, as it is our present purpose only to call attention to Dr. Hunt's report, which deserves careful perusal.

ANNUAL REPORT OF THE STATE GEOLOGISTS OF NEW JERSEY FOR THE YEAR 1880. By George H. Cook. Published by the Survey.

Besides a long and exhaustive chapter on surface geology, last year's report of the Geological Survey of New Jersey contains a timely and valuable compilation concerning the iron ores of that State. Prof. Cook estimates the production of the New Jersey mines during the year 1880 at 840,000 tons, an excess of 350,000 tons above the product of 1879, and of 175,000 above that of 1873, when the former maximum was reached. He gives a list of the mines of the State, indicating those which have been producers during the year. In most cases he adds information concerning the owners, output, character of the ore, &c., and for newly opened mines gives a description of the nature of the deposit and analyses. A second chapter of direct practical interest is on the refractiveness, tests and classification of fire-clays. One hundred and twenty-three clays, kaolins, feldspars and fire-sands, from New Jersey and from the best known clays of this country and Europe, were tested in a Deville and in a Sefström furnace. The officers of the survey have made a number of analyses of soils, and there are valuable chapters on drainage and water supply and wells. The assayer of the survey has dashed to pieces many fond hopes of gold and silver bonanzas, by reporting small quantities only of those precious metals in specimens submitted to him. The report closes with statistics of iron ore, clay, brick and marl, and in an appendix tables of temperature, rainfall, &c., are given.

Chemists and Chemists.

To the Editor of The Iron Age.—DEAR SIR: The very interesting letter of Dr. Henry Wurtz, in your issue of this week, induces me to contribute my quota to the discussion of the "Practical Value of Chemical Analysis," although the discussion promises to be as interminable (but I hope more useful) than the one on "What is Steel?"

Dr. Wurtz says that, after graduation from a school in which analytical chemistry is ostensibly taught, "ten years of diligent, varied and faithful laboratory work would not be too adequate a further preparation for entering conscientiously upon the pursuit of a specialty in applied chemistry." "Science," he says, "cannot be converted into a trade without losing certain of its essentialities, and becoming, as it does, a worthy subject of popular disparagement." Further, "to be a true specialist, *in the scientific sense*, requires that a man should be previously pre-eminently thorough as a generalist."

I have italicised the words "in the scientific sense," and in this sense I do not dispute any of Dr. Wurtz's conclusions; but there is another standpoint than that of the scientist from which this whole subject may be viewed, viz., that of the practical metallurgist, and as such I beg leave to consider it.

The truly scientific man works for the love of science; all his work is for the purpose of advancing scientific knowledge. He is the servant of science. The practical metallurgist, as far as is possible, uses science as his servant, not as his master. He uses chemistry and all the applied sciences for the actual benefits they bring him, measured by a money standard, and he pays for them whatever they will bring in the market. He may give all due honor to the true scientist, who makes original chemical researches and advances the sum of human knowledge; he gives his money (too small an amount possibly) to the so-called specialist who advances his own private knowledge as to the percentage of iron contained in a certain ore.

In the manufacture of steel, for instance, he uses the science of chemistry only so far as it will tell him regularly the amount of iron, carbon, silicon, sulphur, phosphorus, manganese, and occasionally the amount of copper, and one or two other elements, in a certain limited number of raw materials and products. He employs a "specialist" in chemistry to tell him this—what is called an "iron chemist," or perhaps the newly invented "alleged chemist." Dr. Wurtz holds that to be a true specialist, *in the scientific sense*, requires that a man should be "previously pre-eminently thorough as a generalist," that he should have at least 10 years of varied laboratory work before becoming a specialist. From the standpoint of the practical metallurgist, I believe that two years training in one of those schools where "analytical chemistry is ostensibly taught" (I mean a good one, such as the Sheffield Scientific School is reputed to be), and one year's subsequent conscientious practice under a good iron chemist, is a better preparation for becoming a specialist in iron chemistry than ten years of varied work in a general laboratory. I believe that I would rather trust the figures representing the percentages of carbon, silicon, sulphur, phosphorus and manganese given by such a specialist, than I would those given by one who had, before becoming a specialist, been pre-eminently thorough as a generalist, and this for the same reason that I would rather trust a bookkeeper who knew nothing of higher mathematics to add long columns of figures, than I would a professor of algebra and calculus.

The ordinary iron and steel-works chemist is really more a tradesman than a scientist. His whole work is limited to a certain number of definite and exact operations, the theory of which has all been worked out by others. In the determination of carbon, phosphorus, sulphur, silicon and manganese in steel, which are the five elements he has most generally to determine, he follows a definite routine. He may be so little of a scientist as not to know the reason of many of the operations he performs, but his success—that is, the accuracy of his results, for which his employer pays him—is dependent not at all upon his scientific knowledge, but upon the two conditions of his using the right methods to work by and of his care in manipulation.

The whole criticism upon the "alleged chemists" at the recent meeting in Philadelphia, as I understand it, was not from the scientific standpoint, but from the practical one. It was not the scientists who were criticised, but the "alleged chemists" who are employed in various iron and steel works. I think I started this criticism myself by merely mentioning, in the discussion on Mr. Ford's paper on manganese determinations, the fact that I had obtained a number of widely different figures from different chemists to whom I had sent samples from one piece of steel. I will here repeat the figures, in the hope that they may bring the readers of this back to the original point upon which the criticism was based, viz., the great necessity that exists for a revision of all the methods of determining manganese in steel, and the adoption by iron chemists of some good method which could be relied upon for correct and uniform results in the hands of a careful worker. Here are the figures, all being from one heat of steel, and all but the first two from one identical piece of plate:

	Manganese.
Chemist—A.1	.434
" —A.2	1.14
" —A.3	.61
" —B.1	.613
" —B.2	.58
" —B.3	.33
" —C	.324
" —D.1	.451
" —D.2	.453
" —E	.303

The three results obtained by Chemist A. were obtained several months apart, he having no knowledge that the samples were duplicates. B.1 and B.2 were made by another chemist by the acetate of soda and bromine process, and B.3 by the same chemist, since the Philadelphia meeting, by the process described by Mr. Ford (nitric acid and chlorate of potash), he having come to the conclusion that the method he formerly used was inaccurate. C. was, I believe, also made by the nitric acid method by the chemist of a Bessemer works. D.1 and D.2 were duplicate analyses, made by a professor of chemistry in a technical school. Method not stated. E. was made by myself, by the method published by Mr. A. A. Blair in the reports of the United States Test Board (the acetate of soda process, with modifications to secure great accuracy); but as *The Iron Age* has said, editorially, that I am not a chemist, I place no reliance on my own figures.

Chemists A. and D. would, I think, be reckoned as generalists by Dr. Wurtz, as they have each had more than 10 years' experience in varied laboratory work—Chemist A., I believe, the longest. B. is an "alleged chemist"—that is, a young graduate with two years' experience. With C. I have no acquaintance, and E. is not a chemist at all. As the steel, according to the mixture from which it was made, could not have contained more than 0.7 manganese, I think it must be admitted that the generalist of longest experience, A., gives more erroneous results than the specialists, whatever the actual percentage of manganese in this steel is. A sample of the same plate of steel is now in the hands of another chemist, the result not yet reported; and if any chemist, scientist, generalist, specialist or alleged chemist will write me, I will be glad to furnish him a sample of drillings from the same plate for him to try his hand on. The only condition I make is that he shall not charge anything for his analysis, for enough money has already been spent in trying (alas! in vain) to find out how much manganese that steel really contains.

As I have said, this whole question is not chiefly for the scientists, but for the "iron chemists." I believe, as I have stated, that the whole trouble has arisen from one, or both, of two causes—first, the use of inaccurate processes of determination; second, carelessness. I think the iron chemists should continue to discuss this matter (getting the help of the generalists if possible), with the end in view of learning what are the best processes in iron chemistry, and then each chemist for himself should learn to manipulate these processes in such manner as to secure uniform results.

I hope *The Iron Age* will not find it necessary to condemn me for being more aggressive than the occasion warrants—as it did in its report on the Philadelphia meeting—for I shall esteem aggressiveness a virtue if it will lead the iron chemists to consider the error of their ways, and how they shall be able to give us correctly the percentage of manganese or other element in a single piece of steel. Yours truly, WM. KENT.

JUNIATA IRON AND STEEL WORKS,
PITTSBURGH, PA., Mar. 18, 1881.

METALLURGICAL NOTES.

PRODUCTION OF IRON AND STEEL IN FRANCE IN 1880.

The French Mining Department has just published a preliminary statement of the production of the iron and steel works of the country during the last year. As the figures given below (metric tons) will show, it compares very favorably with the record of the preceding year:

	1879.	1880.
PIG IRON.		
Coke mill pig	1,049,806	1,374,642
Charcoal mill pig	40,034	47,025
Mixed " "	7,284	13,037
Total	1,097,124	1,434,704
Coke foundry pig	279,769	262,982
Charcoal " "	6,980	19,305
Mixed " "	16,413	16,111
Total	303,162	298,398
Total production of pig	1,400,286	1,732,102
WROUGHT IRON.		
Rails	39,980	41,944
Puddled bars	608,840	680,704
Charcoal "	45,516	21,737
Scrap "	25,863	52,003
Puddled plate and sheet	110,533	127,564
Charcoal " "	21,619	17,468
Scrap " "	4,720	10,888
Total wrought iron	857,071	952,308
STEEL.		
Bess'r & open-hearth rails	253,742	279,847
" " bar	36,643	50,176
" " sheet	14,446	17,703
Puddled steel	14,555	18,730
Creusot "	3,942	4,225
Crucible "	7,852	7,561
Old steel recast	85	384
Total	333,265	384,626

DESULPHURIZING PIG IRON.

A question which has been frequently and seriously discussed by metallurgists of late, in connection with the Thomas and Gilchrist process, is that many grades of pig, otherwise suitable for the process, may require desulphurization previous to being blown. Even if as much as 60 per cent. of the sulphur is eliminated during the blow, some grades of pig are too high in sulphur to permit their use for steel manufacture. M. Rollet has described in the *Industrie Minérale* a process by which a portion of the obnoxious element is got rid of during the melting in the cupola. He treats the pig in cupola together with about one-tenth of its weight of a cinder (holding only 20 to 30 per cent. of silica and alumina, the rest being lime) and of a strong quantity of fluorspar. By this means 85, 90, and even in some cases 95 per cent. of the sulphur is eliminated. The following are the results of some analyses made:

	Givors Pig.		Givors Pig.		Pougin Pig.		Longwy Pig.	
	Bef.	Aft.	Bef.	Aft.	Bef.	Aft.	Bef.	Aft.
Carbon	3.500	3.520	3.300	2.750	2.710	2.575	2.900	2.800
Silicon	1.500	0.750	0.160	0.163	0.560	0.310	0.443	0.150
Mang.	1.522	0.970	0.432	0.130	....	....	....	....
Sulphur	0.066	tr.	0.214	0.022	0.572	0.060	0.518	0.051
Phos.	0.060	0.055	0.056	0.045	0.195	0.163	1.421	1.236

The cupola is lined with basic material. It is not, however, necessary to use a cupola. By covering a bath of metal with a layer of basic cinder and with 1 to 2 per cent. of coal dust, the pig will also, at an elevated temperature, be desulphurized. M. Rollet prefers the Pernot furnace for this purpose.

GASES IN IRON AND STEEL.

The English technical journals are commencing to attach some importance to the valuable researches made by Dr. Mueller, of Brandenburg, and to which we have drawn attention from time to time. As yet, the paper read by Mr. E. Windsor Richards and Mr. Stead before the Cleveland Institute has not been published in full, and the only source available as to its contents until now, has been Dr. Mueller's reply to it. We find however, the following list of the analytical results of the gases in metals which were apparently sound:

Ingot number.	Material.	Analysis. C. Per cent.	Mn. Per cent.	Si. Per cent.	Analysis of Gas. Volume of gas to volume of hole. Per cent.	Hydrogen. Per cent.	Nitrogen. Per cent.	Carbonic oxide. Per cent.	Oxygen. Per cent.
VI.	Cast iron	3.65	.6	2.63	75	52.5	44.5	....	....
V.	Hammered iron	.05	.7	.15	28	30.66	69.38	....	....
IV.	Steel high in Si	.42	1.68	1.0	21	67.10	33.30	2.60	....
III.	Soft steel	.17	.89	.09	25	67.21	11.15	3.64	....
II.	Hard steel	.45	.40	.04	74	83.35	14.65	....	....
I.	Rail steel	.33	.69	.10	55	86.68	13.32	0.32	0.37

For convenience sake, we print below the entire list of Dr. Mueller's analyses, which we have published singly in former times as they were reported by him:

Number.	Material.	Vol. of gas to vol. of hole. Per cent.	Tension gas. Atmosphere.	Hydrogen. Per cent.	Nitrogen. Per cent.	Carb'nic oxide Per cent.	Total. Per cent.
1	Bessemer rail steel	48.0	....	93.3	6.7	....	100.0
2	Bessemer spring steel	21.0	....	81.0	18.1	....	99.1
3	Bessemer metal before adding spiegel	60.0	....	88.8	10.5	....	99.3
4	Bessemer metal finished	45.0	3.5	77.0	23.0	0.2	100.2
5	Bessemer pig metal from cupola	15.0	7.0	86.5	13.3	0.2	100.0
6	Bessemer pig metal from cupola	38.0	....	53.3	14.2	....	67.5
7	Pig iron, "Solway No. 1"	3.5	....	52.1	44.0	....	96.1
8	Siemens-Martin metal from Bochum, before adding spiegel	25.0	....	67.8	30.8	....	98.6
9	Bessemer rail steel	20.0	....	76.7	26.3	....	103.0
10	Metal from converter, during blowing of 9	38.0	....	68.2	30.5	....	98.7
11	Pig iron, "George Marien Hütte, No. 1"	20.0	8.0	68.2	30.5	....	98.7
12	Bessemer metal, Westphalian	10.0	....	68.2	14.8	....	83.0
13	Rail steel, from Prevali	51.0	4.5	78.1	23.7	....	101.8
14	Unsound rail steel, forged	5.0	....	57.2	48.1	30.5	135.8
15	Rail metal from very spongy ingot, rolled	7.3	....	54.9	45.5	5.9	106.3
16	Round steel ingot, Bochum	17.0	....	99.4	5.9	0.2	105.5
17	The same after forging	5.5	....	97.4	85.3	0.2	182.9

WORKING PIG LOW IN MANGANESE BY THE BASIC PROCESS.

It is well known that the presence of manganese in the pig iron decreases the disadvantages of the after-blow in the basic process, and that also manganese enters into the cinder from the beginning of the blow. The conversion of pig low in manganese requires larger final additions of ferromanganese, and there is, besides, some danger of explosions. A close study of the Thomas and Gilchrist process will show that the quantity of manganese in the blown metal will be larger if the percentage present at the beginning of the after-blow was greater, and that to a certain extent phosphorus itself protects the metal from being overblown. These considerations have suggested to Prof. Josef von Ehrenwerth an improved method for working pig low in manganese by the basic process. He blows the pig first in the ordinary way, but after the elimination of the silicon, preferably during the after-blow, he adds spiegeleisen or ferromanganese, so as to make steel ranging from 0.20 to 0.40 per cent. of manganese. Prof. Ehrenwerth is confident of being able to work pig containing no manganese in this way, and in a communication states that it promises to make pig low in manganese as valuable for the process as manganiferous metal which is more costly.

New Western Union Stock Issued.—The arbitrators appointed to value the plant of the American Union Telegraph Company awarded the Central Construction Company $10,000,000 in stock and $5,000,000 in bonds. About one-half of this was paid previous to the consolidation. Subsequently the Western Union Company issued its new stock for the balance, and on the 17th the Central Construction Company divided it up among its stockholders, who are identical with the principal stockholders of the American Union Company. None of the injunction proceedings took any account of this indebtedness to the construction company. The telegraph people say that it was never contemplated to interfere with the payment, but Mr. Rufus Hatch, when spoken to, characterized the issuance of the new stock as a trick to evade the injunction in part, and said that, in his opinion, the orders of the court had been disregarded.

The electric light is fast coming into use on the steamship piers, to assist in loading and discharging, as well as for office purposes. The White Star Steamship Company have adopted the systems owned by the United States Electric Light Company, expecting to effect a reduction of $100 per month on the gas bill of $260 per month, as recently rendered, and the Pacific Mail and State Line docks are similarly provided.

The Latest Methods for Producing Photo-Tracings in Black and Color.

Two new processes for taking photo-tracings in black and color have recently been published in the *Photographic News*—"Nigrography" and "Anthrakotype"—both of which represent a real advance in photographic art. By these two processes we are enabled, for the first time, to accomplish the rapid production of positive copies in black of plans and other line drawings. Each of these new methods has its own sphere of action; both, therefore, should deserve equally descriptive notices.

For large plans, drawn with lines of even breadth and showing no gradated lines, or such as shade into gray, the process styled "nigrography," invented by Itterheim, of Vienna, and patented both in Germany and Austria, will be found best adapted. The base of this process is a solution of gum, with which large sheets of paper can be more readily coated than with one of gelatine; it is, therefore, very suitable for the preparation of tracings of the largest size. The paper used must be the best drawing paper, thoroughly sized, and on this the solution, consisting of 25 parts of gum-arabic dissolved in 100 parts of water, to which are added 7 parts of potassium bichromate and 1 part of alcohol, is spread with a broad, flat brush. It is then dried, and if placed in a cool, dark place, will keep good for a long time. When used, it is placed under the plan to be reproduced, and exposed to diffused light for from five to ten minutes—that is to say, to about 14 degrees of Vogel's photometer; it is then removed and placed for 20 minutes in cold water, in order to wash out all the chromated gum which has not been affected by light. By pressing between two sheets of blotting paper the water is then got rid of, and if the exposure has been correctly judged, the drawing will appear as dull lines on a shiny ground. After the paper has been completely dried it is ready for the black color. This consists of 5 parts of shellac, 100 parts of alcohol and 15 parts of finely-powdered vine-black. A sponge is used to distribute the color over the paper, and the latter is then laid in a 2 to 3 per cent. bath of sulphuric acid, where it must remain until the black color can be easily removed by means of a stiff brush. All the lines of the drawing will then appear in black on a white ground. These nigrographic tracings are very fine, but they only appear in complete perfection when the lines of the original drawing are perfectly opaque. Half-tone lines, or the marks of a red pencil on the original, are not reproduced in the nigrographic copy.

"Anthrakotype" is a kind of dusting-on process. It was invented by Dr. Sobacchi in the year 1879, and has been lately more fully described by Captain Pizzighelli. This process—also called "photanthratography"—is founded on the property of chromated gelatine which has not been acted on by light to swell up in lukewarm water and to become tacky, so that in this condition it can retain powdered color which had been dusted on it. Wherever, however, the chromated gelatine has been acted on by light, the surface becomes horny, undergoes no change in warm water and loses all signs of tackiness. In this process absolute opacity in the lines of the original drawing is by no means necessary, for it reproduces gray, half-tone lines just as well as it does black ones. Pencil drawings can also be copied, and in this lies one great advantage of the process over other photo-tracing methods, for, to a certain extent, even half-tones can be produced.

For the paper for anthrakotype an ordinary strong, well-sized paper must be selected. This must be coated with a gelatine solution (gelatine, 1; water, 30 parts), either by floating the paper on the solution, or by flowing the solution over the paper. In the latter case the paper is softened by soaking in water, is then pressed on to a glass plate placed in a horizontal position, the edges are turned up, and the gelatine solution is poured into the trough thus formed. To sensitize the paper, it is dipped for a couple of minutes in a solution of potassium bichromate (1 in 25), then taken out and dried in the dark.

The paper is now placed beneath the drawing in a copying frame and exposed for several minutes to the light; it is afterward laid in cold water in order to remove all excess of chromate. A copy of the original drawing now exists in relief on the swollen gelatine, and in order to make this relief sticky, the paper is next dipped for a short time in water, at a temperature of about 28° or 30° C. It is then laid on a smooth glass plate, superficially dried by means of blotting paper, and lampblack or soot evenly dusted on over the whole surface by means of a fine sieve. Although lampblack is so inexpensive and so easily obtained, as material it answers the present purpose better than any other black coloring substance. If now the color be evenly distributed with a broad brush, the whole surface of the paper will appear to be thoroughly black. In order to fix the color on the tacky parts of the gelatine, the paper must next be dried by artificial heat—say by placing it near a stove—and this has the advantage of still further increasing the stickiness of the gelatine in the parts which have not been acted upon by light, so that the coloring matter adheres even more firmly to the gelatine. When the paper is thoroughly dry, place it in water and let it be played on by a strong jet; this removes all the color from the parts which have been exposed to the light, and so develops the picture. By a little gentle friction with a wet sponge, the development will be materially promoted.

A highly interesting peculiarity of this anthrakotype process is the fact that a copy, though it may have been incorrectly exposed, can still be saved. For instance, if the image does not seem to be vigorous enough, it can be intensified in the simplest way; it is only necessary to soak the paper afresh, then dust on more color, &c.; in short, repeat the developing process as above described. In difficult cases the dusting on may be repeated five or six times, till at last the desired intensity is obtained.

By this process, therefore, we get a positive copy of a positive original in black lines on a white ground. Of course, any other coloring material in a state of powder may be used instead of soot, and then a colored drawing on a white ground is obtained. Very pretty variations of the process may be made by using gold or silver paper and dusting on with different colors, or a picture may be taken in gold-bronze powder on a white ground. In this way colored drawings may be taken on a gold or a silver ground, and very bright photo-tracings will be the result. Some examples of this kind that have been sent us from Vienna are exceedingly beautiful.

Summing up the respective advantages of the two processes we have above described, we may say that "nigrography" is best adapted for copying drawings of a large size. The copies can with difficulty be distinguished from good autograph, and they do not possess the bad quality of gelatine papers—the tendency to roll up and crack. Drawings, however, which have shadow or gradated lines cannot be well produced by this process. In such cases it is better to adopt "anthrakotype," with which good results will be obtained.

Political and Industrial Economy in Japan.

The Japanese are more and more disposed to help themselves. They have learned to build and equip the best war ships, and are slowly building up a merchant marine. Several large ships are now on the stocks in that country. The best foreign teachers and mechanics have been employed. The Japanese want a new era of industrial development. Her mines of coal, gold, silver and iron are undeveloped. Her manufactures are restricted to a few articles which can be exported. The English papers published in Japan discourage all attempts to enlarge the manufacturing industries of that country. The Japan *Mail* attempts to be facetious over the statements made by a thoughtful Japanese, Sada Kaiseki, of Higo, who calls attention to the fact that 38,000,000 Japanese must be supplied principally with kerosene, and with lamps in which to burn it. These lamps he estimates at "3 yen," or about $2.65 a lamp. He maintains that not only the kerosene, but the lamps, ought to be supplied by Japanese enterprise and industry. He makes the following statement for the benefit of his countrymen:

"For seven summers poverty and distress have been multiplying themselves in our midst by a yearly co-efficient of ten. The maximum of misfortune has been attained in Tokiyo. There in every street are three or four vacant houses, from each of which seventeen or eighteen bankrupt tenants have been evicted in one-third the same number of seasons. And all this has been brought about by an unfavorable balance of trade—an excess of imports over exports; a constant outflow of Japanese money and a resultant depreciation of Japanese produce, as well as a debilitation of Japanese producers. A moment's examination of the articles imported and the prices paid for them, will prove this at once. Thus, we have of European and American goods: stuffs, as cloths, woolens, velvets, camlets, cotton and so forth, which at the rate of seven yen per man of the whole population, gives a yearly expenditure of 266,000,000 yen; umbrellas and parasols, one for every three individuals of the population, say 10,000,000 yen; leather for boots, hand-bags, tobacco pouches, saddles and so forth, about 1,000,000 yen; boot brushes, blacking, 500,000 yen; stoves, 500,000 yen; cement, 100,000; iron for nails, farming implements, bridges, fences, and so forth, 10,000,000; sugar, 5,000,000; machinery, 3,000,000; arms and accoutrements, an untold sum; finger rings, 250,000 yen; gloves, 500,000; comforters for the neck, 5,000,000, *i. e.*, one at 50 cents for every fourth individual of the population; caps and hats, 30,000,000; velvets, camlet and other stuffs for making pattern-straps, 2,500,000; glass, 100,000; soap, 500,000; paper and envelopes, 300,000; slates and school books, 5,000,000; silver for manufacturing purposes, 1,000,000; medicines, 10,000,000; lead, 1,000,000; medical instruments, 2,000,000; watches and clocks, 5,000,000; carpets, 5,000,000; toys for children, 1,000,000; toys for adults, as musical boxes and so forth, 1,000,000; dye powders, 10,000,000; paints, 600,000; photographic lenses, chemical, &c., 5,000,000; tin 2,000,000; beans, 1,000,000; barbers' tools, as twelve kinds of hair oil, scissors, combs, tuning forks (!), aprons, towels, mirrors, &c., 5,000,000; paper, 1,500,000. Next we have Chinese goods: Paper of various sorts, 10,000,000; ornamental woods, as Shitan, Tagayasu, &c.. 2,500,000; vermilion, 2,500,000; articles for the tea clubs, as porcelain, jade, crystal, bronzes, &c., 10,000,000; stuffs, 2,000,000; rattan, 1,000,000; rush mats, 100,000; chemicals for dyeing purposes, 50,000; pens and ink, 300,000."

Now, this inventory may be a little extravagant, but the fact that its suggestions are ridiculed by papers published in British interests, is pretty good evidence that they are worth considering.

The inadequate supply of skilled workmen in this country in many branches of industry is severely felt, so that constant drafts are made on Europe to supply the deficiency. This results, in part, from the exclusive policy enforced by our trades unions, there being comparatively few apprentices to fill the places of trained men who have outlived their usefulness. Boiler-makers for the iron works on the lakes have recently arrived from Glasgow in considerable numbers, and a prominent Western manufacturer has been compelled to send to Switzerland for the third time for men skilled in his particular vocation. We must soon have in this country a more general apprenticeship system. In devising means to this end, much can be learned from the Prussian State railroad shops. It is a good sign that there is no lack of applicants wherever opportunities to engage as apprentices in the mechanic arts have been offered.

The official returns of the exports of Swiss products to the United States during the year 1880, show them to have been greater than in any year on record, exceeding those of 1879 by 15,000,000 francs.

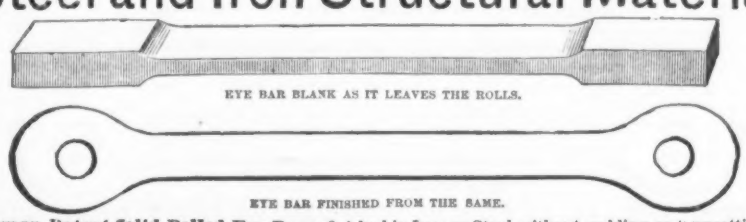
ANDREW KLOMAN,

A. C. KLOMAN, C. H. KLOMAN, } Testamentary Trustees.

PITTSBURGH, PA.,

MANUFACTURER OF

Steel and Iron Structural Material



EYE BAR BLANK AS IT LEAVES THE ROLLS.

EYE BAR FINISHED FROM THE SAME.

Kloman Patent Solid Rolled Eye Bars, finished in Iron or Steel without welding or "upsetting" Universal Mill Plates of Iron or Steel. Steel Rails of all sizes and patterns. Splice Bars. Channel Bars for Thielsen Car Truck. SPECIALTY—Unusual shapes and sizes in Steel or Iron; Angles, Tees and other structural shapes in Iron or Steel.

AKRON IRON COMPANY,

AKRON, OHIO,

Sole Manufacturers of

Patent Hot Polished Shafting.

Medal of Superiority awarded at American Institute Fair of 1880.

This Shafting is superior to any in the market, and commends itself to the trade for the following reasons, viz:

1st. It is perfectly straight and round.

2d. It can be finished accurately to any desired gauge.

3d. It will not rust or tarnish easily.

4th. It will not warp or spring in key seating.

5th. Its surface is composed of magnetic oxide of iron, and consequently presents a journal or bearing surface that is unexcelled.

6th. The peculiarity of its manufacture is such as to entail loss in making it, if other than superior stock is used. Those purchasing it may therefore be assured of receiving first-class material.

Price lists, catalogues and references furnished on application.

Where parties desire it we cut keyways or splices any length required, at a moderate charge.

AKRON IRON CO., Akron, Ohio.

AGENTS:

E. P. BULLARD, 14 Dey Street, N. Y.
S. E. BLISS, 89 Lake Street, Chicago, Ill.
D. N. BROWN MACHINERY CO., St. Louis, Mo.
J. H. KERRICK & CO., Indianapolis, Ind.
JOSHUA HENDY, San Francisco, Cal.

For Coal and Ore Separators, Revolving Screens, Jigs, Washers, Stamp Batteries, Mining and Smelting Works, Silver Reduction and Concentrating Works, etc., etc.

For Centrifugals, Brewing, Distilling, Wool and Sugar Machinery, Purifier Trays for Gas Works, Coal and Coke Works, Flour, Cotton, Oil, Paper and Pulp Mills, etc.

Iron, Steel, Copper, Brass, Zinc and other metals punched to any size and thickness, for all uses.

HARRINGTON & OGLESBY,

Nos. 43, 45 and 47 South Jefferson St., . . CHICAGO, ILL.

Special discounts to the trade. Correspondence solicited.

PENFIELD BLOCK WORKS, Lockport, N. Y., U. S. A.

Manufacturers of a full line of

BLOCKS

HENRY B. NEWHALL, 195 Chambers St., New York Agent.

Sheaves, Faucets, Mallets and Car Pushers. Write for catalogue and prices.

S. H. & E. Y. MOORE, 163 & 165 Lake St., Chicago Agents.

THE IDEAL COFFEE POT.

Patented July 24, 1880.

The engraving shows that the "Ideal" is the most perfect, simple and complete pot ever produced and as such is the best selling pot in the market. It sells on its own merits. By its use the coffee is always regular, of the same quality, strength, and perfectly clear. A child can make better coffee in this pot than can an adult by the old method of boiling. It is without doubt the best pot in the world to day, and you can sell them. They are used and recommended by Mrs. President Hayes, Mrs. Bishop Simpson, Hon. John Jay, Gen. B. Flint, California, and by everybody who has used one.

Prices: Polished Tin, per doz., 3 pt., $7.80; 5 pt., $10.20; 7 pt., $13.20; 9 pt., $15. Nickel Silver, 3 pt., $15; 5 pt., $19.80; 7 pt., $24; 9 pt., $27. The nickel silver pots are nickel-plated outside and silver-plated inside. They are very handsome. Discount 25 per cent. Send for circular or 50 cents for a 5-pint sample pot.

IDEAL COFFEE POT CO., 622 Filbert St., Philadelphia, Pa.

SABIN MFG. CO.,

MONTPELIER, VT., MANUFACTURERS OF

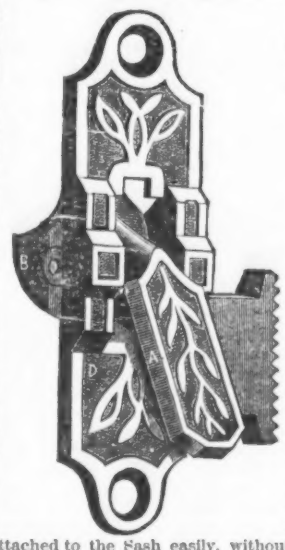
DOUBLE-ACTING SPRING BUTTS,

SABIN'S LEVER DOOR SPRINGS, For heavy doors,

BOSS AND CROWN SPRINGS, For light doors.

Send for Catalogue. Represented in New York by ***DAVID HYMES & CO., 92 Church St.***

STRONG'S UNIVERSAL SASH-LOCK



Secures the Window perfectly in any position. Burglar proof. The wind cannot rattle the windows.

Is attached to the Sash easily, without in the least weakening or defacing it. No holes to be cut in casings, no attachments thereto, no abrasion no matter how long used, nor how severely. Is never out of order. Address

Universal Sash-Lock Co.,

S. W corner Hamilton and Liberty Streets,

ALBANY, N. Y.

Bergen Port Spelter

MINES: Lehigh Valley, Pa. WORKS & FURNACES Bergen Port, N. J.

The only Miners and Manufacturers of

PURE

LEHIGH SPELTER

From Lehigh Ore.

Especially adapted for

Cartridge Metal and German Silver.

Also manufacturers of

BERGEN PORT OXIDE ZINC.

Superior for LIQUID PAINT on account of its body and wearing properties.

F. OSGOOD & CO., Proprietors.

E. A. FISHER, Agent, 13 Burling Slip, N. Y.

HUBBELL'S PATENT METAL CORNERS

FOR OIL CLOTHS.

Protect them from wearing and are ornamental; *83,500* sold in four months. The real merits of these goods make them standard.

Orders solicited and circulars sent on application.

RAY HUBBELL, Sole Mfr., Northville, Fulton County, N. Y.

CLOTHES WRINGERS.

Steel Elliptic Spring. Self-Adjusting.

T. J. ALEXANDER, Manager, BOSTON, MASS.

COVINGTON WIRE WORKS

FRED. J. MEYERS,

Manufacturer of

Champion Fly Traps,

Dish Covers,
Cheese Safes,
Bird Cages,
Moss Baskets,
Wire Counter Railings,
Wire Cloth of Every Description.

Office and Works, *419 & 421 Madison Street,* **Covington, Ky.**

Send for illustrated catalogue of 1881.

TELESCOPE TUBES.

Fine Mandrel-drawn Tubes, from Brass or German Silver. Tubes for sliding one within the other made to order. Manufactured by ROBT. T. DEAKIN & CO., 500 N. 12th St., Philadelphia, makers of the American Improved Brass Garden Syringe.

GEO. M. EDDY & CO.,

Manufacturers of

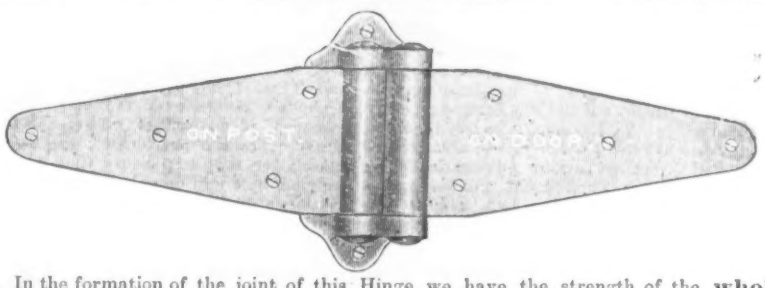
Measuring Tapes

Of Cotton, Linen & Steel,

FOR ALL PURPOSES.

351 to 353 Classon Ave., Brooklyn, N. Y.

LEWIS' PAT. STRAP HINGE.



In the formation of the joint of this Hinge we have the strength of the **whole width** of the strap, instead of **one-third,** as in the ordinary Hinge. The leaves and rivets are wrought iron, and the malleable parts on the sides (all of which have been tested) form a brace when secured to the post, thus giving additional strength; and as **strength** in a Hinge, **rather than length of iron,** is the main object, the patent is cheaper than the common. To avoid confusion, we number them as follows:

Patent Extra Heavy..... No.	5½	6½	8½	10	12
Width of Strap at joint.....	2	2½	2¾	3	3½ in.
They are three times stronger than the common	6	8	10	12	14 in.

The numbers and length of the Patent Hinge are identical. We shall prepare a line of Heavy Strap, of same length, but one-half inch narrower than the extra heavy.

LEWIS & CODMAN, Sole Agents, Columbus, Ohio.

DAVID HYMES & CO.,

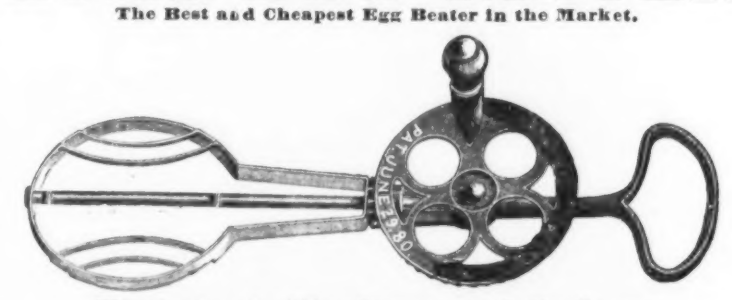
92 Church Street, New York,

Hardware Manufacturers' Agents,

And Sole Manufacturers of the

"ACME EGG BEATER,"

The Best and Cheapest Egg Beater in the Market.



Bargains in Hardware and Cutlery.

Low estimates made on all kinds of small castings in the rough, japanned or varnished.

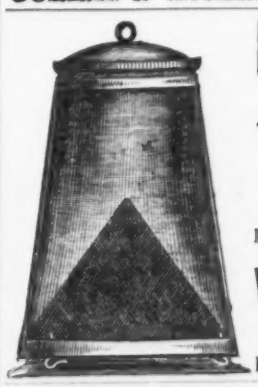
THE UNION DOOR AND GATE SPRING.

The most practical, durable, economical, and best Spring made. It is the only Spring with head securely connected and stationary. It is impossible for the Spring to slip from the head. The most objectionable feature of other Springs, the extreme difficulty to secure the tension, is in this entirely avoided. We manufacture four sizes, coppered or japanned. At an early day we will be able to fill orders for our Spring Hinges, which are the only adjustable and low priced Hinges now made. Quotations cheerfully furnished by

The Edwards Manufacturing Company,

DETROIT, MICH.

DURRIE & McCARTY, Sole Agents, 97 Chambers Street, N. Y.



PARAGON FLY TRAP,

Manufactured under the Harper & Parker Patents.

The Only Trap with a Detachable Lid.

The largest, best made and most saleable Trap in the market. For price to Jobbers and Exporters, address

W. H. QUINN & CO., Sole Agents,

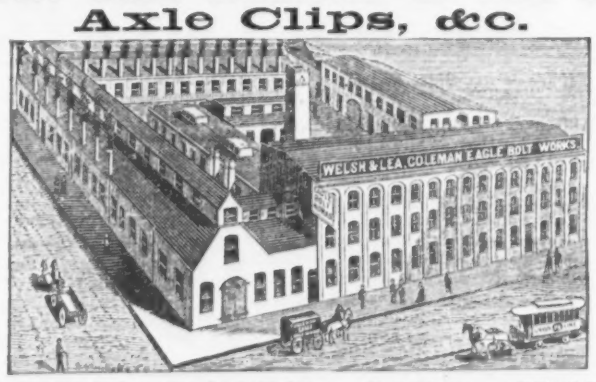
79 Chambers Street, NEW YORK.

Factories—CINCINNATI, OHIO.

NORWAY IRON CARRIAGE & TIRE BOLTS,

Axle Clips, &c.

Only Medal, Phila., 1876.



Only Medal, Paris, 1878.

COLEMAN EAGLE BOLT WORKS,

WELSH & LEA, Philadelphia, Pa.

Philadelphia Smelting Co.,

S. E. Cor. Twelfth and Noble Sts., PHILADELPHIA.

GENUINE BABBITT,

Guaranteed at a speed of 10,000 a minute, and at any pressure for 10 years.

DEOXIDIZED BRONZE,

Superior to Phosphor Bronze or any other alloy of Copper and Tin for Machinery Journals.

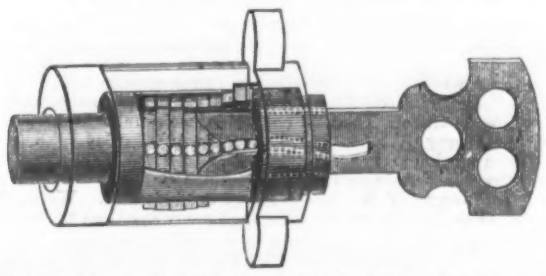
PHILADELPHIA, October 4, 1879.

PHILADELPHIA SMELTING COMPANY, City.—GENTLEMEN: After a trial of eighteen months of your "Deoxidized Bronze" as journal boxes in our rolling mill, where great pressure is required, we take pleasure in recommending it as being superior to any we have heretofore used.

Very truly, HENRY DISSTON & SONS.

Improved Night Latch.

Mr. A. G. Newman, 1180 Broadway, New York, is just bringing out a new form of rim night latch which has several features in connection with the barrel that are of interest. The key is flat and very small. It is divided in the center by a curved slot, by means of which the tumblers are put in position, so that the lock may be opened. In the cut the key is shown partly inserted in the keyhole. No less than ten tumblers are used, which are so arranged as to need no springs, acting automatically by gravity alone. Their great number makes the work of picking the lock almost impossible, and, so far as we have any experience, the lock is as safe from being opened



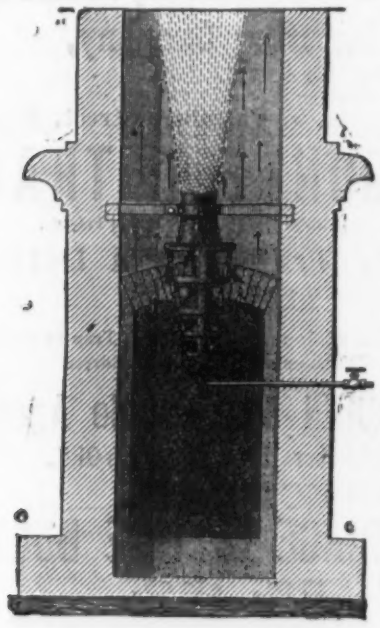
Improved Night Latch.—Cut of Cylinder and Key, showing Operation of Tumblers.

without a key as the most expensive of regular tumbler locks. The cylinder is held upon the lock by a couple of long screws, by means of which also the lock is adapted to different thickness of doors. The mortise form of this lock is very easily applied. After the latch is mortised into the door, two holes are bored for cylinder and knob, while the work is finished by two small ones for the screws. This improvement is also being applied to locks suitable for a great variety of places.

Korting's Steam Blast Nozzle.

Our engraving shows a new form of steam jet for creating a draft in ventilating flues, chimneys, &c., for which Mr. A. Aller, of 109 Liberty street, New York, is the general agent. The ordinary steam jet, it is well-known, is rather extravagant in the use of steam, and does not produce any considerable result; for these reasons it has never been used, save in cases of necessity. The trouble has been to apply the power of the steam to the air. This can only be done by means of the friction between the surface of the jet of steam and the air through which it passes. This friction is quite limited in amount, and as the jet is small, the friction will only carry an insignificant quantity of air. Increasing the size of the jet is excessively wasteful, since the friction only increases in proportion to the increase of circumference, while the quantity of steam used increases much more rapidly than the area itself, a comparatively small pipe, continuously open, being able to discharge all the steam made by a very large boiler.

In the jet, or, more properly, the ejector, shown in the engraving, the nozzles are so disposed that a small jet of steam is enabled to move a vast quantity of air. It must be remembered that the power actually required to move the air is almost nominal,



Korting's Steam Blast Nozzle.

the great difficulty being to "get hold of a a load." At the bottom of the apparatus is placed a single jet. This moves a stream of air rapidly several times its own diameter. Over and around the jet is placed a nozzle just large enough to secure this combined stream of steam and air, which in turn is used as a jet itself. Although moving somewhat slower than the steam as it comes from the pipe, it has a vastly increased friction surface, and carries with it, as it leaves its own nozzle, a greater stream of air than did the original jet of steam. The compound blast thus formed is again employed as a jet in a nozzle, its increased area adding to the amount of air which is dragged forward. This multiplication of jets, or ejectors, as they might be called, is repeated no less than six times. The resulting stream of air is, of course, enormous, while, in comparison, the quantity of steam used is trifling. The smallest size uses a ½-inch pipe, and is rated to move 500 cubic feet of air per minute through an 8-inch pipe. As the air is carried forward by the combined jets, of course a vacuum is formed below, and when necessary the apparatus can be used for exhausting. Its value in small flues, or those which are crooked and rough, when a good natural draft is impossible, is very great indeed. The largest size used (only a 2½ inch steam pipe) can move something like 15,000 cubic feet per minute. Applied to a chimney it would furnish draft sufficient to burn 3000 pounds of coal per hour.

The World's Fair.

Within the past week the International World's Fair Commission have been inspired with new hopes, from the filling up of the subscription list to the full amount of $1,000,000, which qualifies that body to perform a corporate act, provided ten per cent. is paid over to its fiscal agent, the Farmer's Loan and Trust Company. At the same time, a shadow comes over the scene from the rumored, if not actual, retirement of Gen. Grant from the presidency, the ostensible reason for this step being that his official connection would be only a source of embarrassment during his absence in Mexico for two months to come. The fact cannot be denied, however, that the World's Fair scheme has not been floated with that buoyancy which had been expected, and that even the magic influence of Gen. Grant's name was comparatively without effect. It is more than suspected, too, that he is somewhat chagrined by the virtual rejection of his pet project of a fair in Central Park, which an act of the Legislature rendered impracticable, and it could hardly be expected that he would submit gracefully to defeat.

Aside from all personal differences, there is a general apathy in regard to the World's Fair of 1883 which, up to the present moment, argues poorly for a triumphant success. There is not that earnest, hearty co-operation, such as springs involuntarily from popular enthusiasm, and which is indispensable to a great national undertaking. There is reason to fear, too, that private interests are not sufficiently subordinated to the public good. Co-operation, in numerous instances, is made contingent upon the selection of a particular site, the controlling consideration being that "an enormous impetus would be given to real estate improvements" in the locality named. We submit that motives to action of this character, by those who assume to represent national interests, are sordid and circumscribed, totally unworthy of the commercial metropolis. This question of a site still has a paralyzing effect. According to Dr. Newman, "Neither the executive committee nor the commission could say that Inwood was to be the site for the fair. The choice of location could not be determined until the subscriptions had been closed and the vote of the stockholders taken. They alone could decide for or against Inwood. They would have it in their power to hold the fair where they pleased. For all he (Dr. Newman) knew they might dissolve the present executive committee and appoint a new one, and entirely change the programme which had been laid out by the commission. Until the stockholders should come together and take official action it would be idle to predict very much regarding the future of the fair."

Another gentleman prominent in the commission, Mr. Frederick L. Talcott, is of the belief that nothing will be done until at least $3,000,000 shall have been subscribed, as Mr. Vanderbilt's subscription of $250,000 is conditional, and until an unconditional million is obtained, it is hardly practicable to call in ten per cent. We are sorry this is the situation, for it does not speak well for the enterprise of our citizens that a great undertaking of this character should hang fire. If Chicago had this work in hand we might expect a very different handling of it. We do not consider the scheme a failure by any means, but its chances for complete success are by no means so good as we wish they were. Perhaps the management has been a little at fault, and those prominently identified with the movement may have desired to keep the thing too closely in their own hands. A systematic canvas of the business houses of the city would have rolled up an enormous aggregate of small subscriptions, ranging from $50 to $1000 each, and it would have abundantly repaid the effort in two ways—by swelling the subscription and interesting a great many thousands of people who feel that the time for them to take part in the matter has not come. What has been undertaken can be accomplished within the time set if it is taken hold of at the right end, and especially if personal interests and jealousies are not allowed to interfere with the accomplishment of the end sought in the easiest and best way possible.

The inventory of the assets and liabilities of the Joseph Dixon Crucible Company, of Jersey City, shows total liabilities of $1,888,415.40, consisting of bills payable, $1,015,328; capital stock, $734,500; open accounts, $94,235.19; mortgages, $26,200; indorsed paper, $18,152.21. Included in the bills payable are notes aggregating about $614,000 for the accommodation of Fowler, Crampton & Co. The assets are nominally $1,665,004.

During the year 1880, 297,663 tons of iron ore were exported from the island of Elba. The average cost of mining it was 3.28 francs, while the average selling price was 8.75 francs. The government mines are to be leased at a minimum annual rental of 500,000 francs, and with the understanding that not more than 200,000 tons are to be exported.

At the instance of Judge James R. Angel and other representatives of the upper wards in this city comprising the annexed district, it is probable that Mayor Grace will appoint a new rapid transit commission, and that an elevated railroad will be built on Third avenue.

INDUSTRIAL ITEMS.

MAINE.

The Auburn Foundry Company have awarded the contract for building their new foundry to replace the old one. Their new foundry will be about twice the capacity of of the old one and will be 80 by 35 feet in size. It will cost about $2000.

VERMONT.

At the rolling mill at St. Albans from 75 to 80 tons of steel rails are now being turned out daily. This amount is being made from foreign blooms, on account of the steel furnace now undergoing repairs.

MASSACHUSETTS.

The Phœnix Machine Company, of Lowell, a new corporation, has for its officers: W. E. Whitehead, president, and A. T. Atherton, treasurer. The company are putting up a convenient and substantial brick building, three stories in hight.

The new packing and storage building of the Worcester Wire Company, at South Worcester, 200 by 50 feet, is completed.

The Washburn & Moen Manufacturing Company are just completing an enlargement of their works, at Quinsigamond Village, Worcester, nearly doubling their capacity.

The Chapman Valve Manufacturing Company, of Indian Orchard, are to build a new foundry. They now employ 85 hands, and will increase the force as soon as they obtain additional room.

NEW YORK.

Morrison, Colwell & Page, of Cohoes, are erecting a bushing furnace and a scrap furnace, and have in contemplation the erection of three more double puddling furnaces.

The blast furnace at Plattsburgh was put in operation last week by Williams & Reed. John Harnden, of Port Henry, has contracted to make the iron at a stipulated price per ton. Both ore and coal come from the Lyon Mountain region.

L. Katzenstein & Co., 35 Desbrosses street, general machinists, are doing a large business in their metallic packing. The Phœnicia, of the Anchor line, was fitted throughout by them, and they now have orders to supply 10 lake steamers; also, the iron excursion fleet now building for New York harbor. Orders from abroad are heavy, one of the German steamers recently taking out several tons.

PENNSYLVANIA.

The product of Rodman Furnace No. 1 on last Saturday was 58 tons, and for the week ending March 12, 326½ tons, as reported by Mr. Arthur Simpson, foundryman at the furnaces. This is the largest yield ever made by this furnace, and is certainly very good. Mr. McLanahan proposes to start Furnace No. 2 shortly.—*Altoona Tribune.*

The mills at Phœnixville were compelled to shut down last week on account of high water in the Schuylkill River, which backed up French Creek and filled the pits throughout the works.

The Pottstown Iron Company's bloomary went into operation on the 17th. Blooms were made, and everything worked satisfactorily.

A number of furnaces have been blown in in Schuylkill County this month.

Steel nails are now manufactured at the Chesapeake Nail Works, Harrisburg.

An order has been given by the Pennsylvania Railway Company to the Altoona shops to build 1500 freight cars.

We hear that the old Harrisburg Furnace, built by the late ex-Governor Porter, has been sold to the Harrisburg Car Company, and will be put in blast by them immediately.

Of the nine rolling mills in the Shenango Valley, seven are now in operation, and of the two now idle, one, the Wheatland Mill, will probably be lit up at an early day. Of the 31 blast furnaces in the valley, only 15 are in blast, one, the Wampum, having blown in last week.

The Combination Steel and Iron Company, of Chester, report a steadily increasing demand for their ironclad steel. The process consists of inclosing the steel in iron, to exclude the air from the steel, during manipulation in the furnace and under the rolls or hammer. The combination is said to possess all the good qualities of both metals, without the defects of either. The company are now rolling combination tire, plates and merchant bars, round, square and flat. Some of the largest wagon manufacturers in the country are using combination tires, it is said with the most satisfactory results. A medal of excellence was granted by the American Institute of New York in 1878, a silver medal by the Franklin Institute in Philadelphia, and numerous testimonials have been received from parties using the combination.

PITTSBURGH AND VICINITY.

The Pittsburgh Bessemer Steel Company, Limited, started their new works at Homestead last Saturday, making the first ingot at noon. The converting and blooming machine worked very satisfactorily, and will be run steadily from this date.

We hear that Oliver Bros. & Phillips are about to lease or purchase the Shenango Iron Works, at New Castle, together with the Rosena and Sophia furnaces, and will commence to operate the mill immediately, also putting the Rosena Furnace in blast.

The stockholders of the United States Iron and Tin Plate Company held a meeting at their office on Smithfield street, and decided to reduce the capital stock of the corporation from $400,000 to $200,000. To that end they reduced the par value of the shares from $100 to $50.

The Westinghouse Air Brake Company have purchased a large plat of ground on Duquesne way, between Ninth and Tenth streets, and will erect a factory for making a patent switch and patent signal blocks.

On the 15th inst. Mr. Harry Oliver, Jr., of the firm of Oliver Bros. & Phillips, purchased the Ihmsen property for $22,000. The Oliver Wire Company contemplate removing their works from the building of the Standard Nut Company to the property purchased, but have not definitely so decided.

Challinor, Hogan & Co. are running their works on full time.

Moorhead & Co. are erecting a foundry to be used exclusively for making castings and machinery for their own works.

The steel works of Messrs. Anderson & Co. have finally changed hands, and the new joint stock company will take hold this morning. Mr. John Roach, the shipbuilder, is one of the leading spirits in the new company, though, of course, a number of other Eastern capitalists are concerned in the enterprise. The total capital of the company is said to be $5,000,000. The new company will manufacture Bessemer steel. Mr. Anderson will be manager of the present Pittsburgh mill. The company have ten or twelve acres of land at Linden Station, on the Baltimore and Ohio Railroad, in the Fourteenth Ward, on which their upper mill is situated.

Messrs. Witherow & Gordon, builders of hot-blast stoves, have purchased the old nut and bolt works at New Castle and will double the capacity of the works, employ about 500 men, build large additions and manufacture the new patent hot-blasts for furnaces on a large scale.

VIRGINIA.

Amherst Furnace, of Buena Vista estate, Amherst County, was in blast 20 weeks in 1880, and made 1035 tons of charcoal pig iron. Charcoal to a ton of iron averaged 140 bushels, including that used to heat the furnace at the start; the charcoal was made in the vicinity of the furnace. Ore used, from Buena Vista banks, Rockbridge County, from the Primordial, was 2 tons to the ton of iron. The flux used was ½ ton of tufaceous marl to the ton of iron, also from Rockbridge County, from deposits made by waters percolating Valley lime stones. The Messrs. Jordan say: "The marl answers our purposes admirably, and is cheaper than limestone."

James River Steel Manufacturing and Mining Company, Lynchburg, are now turning out daily 45 tons of 16 and 18 pound T rails, and fish plates, bolts, nuts, spikes, &c., for use with same.

In Pulaski, Smyth and Wythe counties, on the southwestern plateau of the Valley of Virginia, four new charcoal furnaces, now almost completed, will go into blast this spring. These are Tipton Furnace, Pierce Furnace, the New River Mineral Company's furnace and the Mercer Iron Company's furnace. There is also a furnace projected in this district by Col. Sayers, who is preparing to build in Rye Valley.

Lucy Selina Furnace No. 2, of the Longdale Iron Company, was blown in for the first time February 11, 1881. The furnace has worked well from the start, and is making 33 tons per day.

In 1880 a new charcoal blast furnace was built near Speedwell, Wythe County, by the Wythe County Iron Company, of which Mr. A. B. Harris is agent. Mr. Harris says: "Our furnace is a new cold-blast furnace of 10 tons capacity and uses charcoal. We have stock on hand ready to go into blast as soon as the weather abates a little."

WEST VIRGINIA.

The La Belle Nail Factory is running full.

The repairs to the Belmont Blast Furnace are nearly completed.

OHIO.

Mr. D. M. Steward, Cincinnati, manufacturer of rolling mill and metal workers' soapstone crayons, and other products of soapstone, reports heavy orders for immediate supply from all parts of the country. He says that his orders for soapstone facings for use in foundries are far ahead of his facilities, and that he is compelled to commence the construction of additional machinery. From parties to whom he had sent small samples of the crayons for machinists' and other metal workers' use, he has received orders for full supplies for the season's trade. For rough drafting on floors or on any rough surface they are durable, convenient, cheap and pleasant to handle.

Mr. J. A. Long, secretary of the the Akron Iron Co., Akron, informs us that there is no truth in the report that the company is to erect a new 70-foot furnace this spring.

The Leetonia *Reporter*, says: Grafton Furnace No. 2 "blowed out" Saturday last, and will remain so for an indefinite period. It is rumored that No. 2 will blow in in a few weeks. The cause of the suspension is said to be a want of coke.

Alice Furnace is working on native ore exclusively, for a few days, making about 50 tons choice foundry daily.

The Morse Bridge Company, Youngstown, is now running its shops both night and day to fill orders.

Belfont Furnace will blow in inside of two weeks; probably one week from next Monday.

S. F. Hess & Bro., have leased the Excelsior Works in Massillon, and intend to engage largely in the manufacture of air and force pumps..

The Geneva Lock Factory recently received an order for 30,000 dozen locks of one pattern. They are now running night and day.

A new company has been organized at Mariette and incorporated at Columbus for the construction of cars, with a capital of $50,000.

Maggie Furnace is working nicely, making 48 tons of No. 1 foundry iron per day.

The entire cost of the blast furnace, with dockage, to be constructed by the Cleveland Rolling Mill Company is stated at $25,000. The company have decided to use a Brush electric light machine of the largest size to light their yard and works.

Boston capitalists have bought a large tract of land at Floodwood, in the Hocking Valley coal region, and are building two large iron furnaces.

ILLINOIS.

The Chicago Spring Co. are at present turning out two tons of wagon and carriage springs per day, and are receiving numerous orders for their patent springs.

The Chicago Retort and Fire-Brick Co. report business very good. They are employing at present 30 hands, which number will shortly be increased to 50. Their specialties are retorts, blocks and linings for furnaces, &c.

The Standard Manufacturing Co. are very busy at present manufacturing a variety of machine screws for fine machinery, &c.

A new organization, to be known as the Gray Iron Co., of which Mr. F. T. June is president, and S. S. Niles, secretary, for the manufacture of fine gray iron castings of every description, will go into operation about June 1, next. They have at present in course of erection one 3-story and basement building (brick), the dimensions of which are 140 x 140 feet, one foundry 140 x 60 feet, and warehouse 2 stories (brick), 40 x 90 feet. They will employ from 150 to 200 men.

Messrs. Thornburg & Glessner have succeeded to the business formerly conducted by N. Hawkins & Co., manufacturers of elevator buckets and iron conveyers; also all kinds of mill supplies.

Messrs. Crandall Mfg. Co., manufacturers of barbed-wire fencing, are running on full time and anticipate a large trade this summer. They will increase the size of their works and put in additional machinery this spring, giving them double the capacity they now have.

Messrs. Cobb & Son, manufacturers of car-seat, door and furniture springs, are at present working on contracts for the Chicago, Burlington and Quincy and the Chicago and Northwestern Railways. They report a constantly increasing volume of business.

The Shoenberger Iron Foundry report business looking up, and anticipate a large trade this spring. They are at present receiving numerous orders from Canadian points.

Messrs. J. F. Temple & Sons, proprietors of the Chicago Farm Pump Works, one of the oldest establishments in this country, report that they are full of orders. They manufacture the only anti-freezing fixtures made; also Churchill's elastic expansion rubber buckets and chain pumps.

GEORGIA.

George R. Lombard & Co., of Augusta, have determined to build a large iron foundry in addition to their present works. The new building will be 200 feet long by 55 feet wide, and 30 feet high in the middle, where the crane will be located.

KENTUCKY.

Davidson & Williams have purchased the old Mental & Lanckart Foundry, in Lexington, paying for the same $4500.

Clear Creek Furnace is in operation, doing well.

Ashland Furnace is doing splendidly, running on an average of 57 tons of mostly No. 1 foundry iron per day.

No terms for the leasing of Boone Furnace having been perfected, this furnace property, as well as Iron Hills, will remain idle during the ensuing business year. Both furnaces and lands are for sale.

TENNESSEE.

Messrs. Jenkins, Hodge & Co., have lately blown in a new cold-blast charcoal furnace at Union, Sullivan County. The bosh is 8½ feet, stack 35 feet high. The ore used is a superior brown hematite, and the product about four tons daily of fine foundry.

Wason Car and Foundry Company, manufacturers of railway freight cars, car wheels and castings, Chattanooga, are at work full blast. They have one contract for 200 freight cars with the E. T., Va. & Ga. R. R., Selma Division.

MINNESOTA.

The Duluth Iron Company are putting in a machine shop in the engine room of the blast furnace. It is intended mainly for their own work, but may take in some from outside. The work of putting in a new hearth is progressing satisfactorily.

MISSOURI.

The Groom Shovel Company are now at work filling an order for a lot of shovels which are to be sent to China. These shovels are manufactured with great care and of the best materials, and our slant-eyed Celestial antipodean neighbors will soon have an opportunity of testing the quality and utility of goods of St. Louisan workmanship. All articles will have the business address of the mercantile firm for whom they are made stamped upon them in Chinese characters, done with a steel die; also, there will be pasted upon them similar business cards, printed in oriental style on paper, which were gotten up in China and sent to St. Louis for the purpose.—*St Louis Age of Steel.*

The large building which was being built as an addition to Rohan's boiler works establishment, has been completed and is now fully occupied by the concern.

The repairs that were being made to the deranged machinery of the Laclede Rolling Mill having been completed, that important integral part of St. Louis' iron industry is again in full operation.

COLORADO.

The report of the Colorado Coal and Iron Company, lately published, says of their blast furnace and proposed steel works: One large hot-blast iron furnace, 65 feet high, 15-foot boshes, with three Siemens-Cowper-Cochrane heating stoves, 58 feet high by 15 feet diameter, and a brick hoist tower, boiler, engine, and casting houses complete, have been erected. It is intended to have the furnace in blast on or before July 1 next. A stone machine shop 48 x 104 feet, and a stone foundry 50 x 50 feet, are finished, and are now supplied with machinery and in operation. Suitable space has been reserved in the general plans for four or more furnaces when required. The plans for the Bessemer steel plant, to be erected in connection with these furnaces, have been fully and carefully matured, and the construction of the necessary buildings is in rapid progress. A converter house for two 5-ton Bessemer converters, and a rail mill, heating furnaces, &c., are now in course of erection, and it is intended to have the steel works in full operation before the end of the present year. The first capacity of the present plant (conveniently arranged, however, for all probable future extensions) will be 30,000 tons of steel rails per annum, running single turn, and as soon as the additional furnace is erected to supply the necessary amount of pig iron, the product of the steel works can be doubled by also running at night.

Forty-three thousand tons of steel shipping were built on the Clyde in 1880, and 18,000 tons are now in course of construction, including three new steamers of a pioneer line to sail between Liverpool and New York or Baltimore.

WITHEROW & GORDON,
Engineers & Contractors,
PITTSBURGH, PA.

Sole Agents for the

WHITWELL HOT BLAST STOVES.

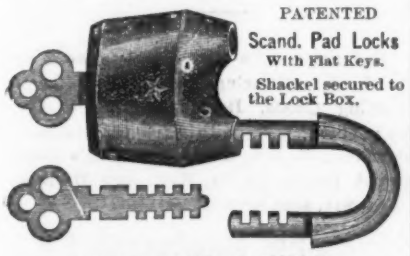
OVER 600 IN USE.

The following parties either have them in use or under construction:
Cedar Point Iron Co., N. Y.
Dunbar Furnace Co., Pa.
Crane Iron Co., Pa.
Pennsylvania Steel Co., Pa.
Neshannock Iron Co., Pa.
R. H. Coleman, Lebanon, Pa.
Chester Rolling Mill Co., Pa.
Davenport, Fairbairn & Co., Pa.
Isabella Furnace Co., Pa.
Paxton Rolling Mill Co., Pa.
Spearman Iron Co., Pa.
Etna Iron Works, Ohio.
Milton Coal and Iron Co., Ohio.
Winona Furnace Co., Ohio.
Moss & Marshall, Ohio.
H. Campbell & Sons, Ohio.
Hocking Valley Iron Co., Ohio.
Cleveland Rolling Mill Co., Ohio.
Meier Iron Co., Ill.
North Chicago Steel Co., Ill.
Union Iron and Steel Co., Ill.
Means & Culbertson, Ky.
Ashland Furnace Co., Ky.
Norton Iron Co., Ky.
Southern States C., I. and S. Co., Tenn.
Sewanee Furnace Co., Tenn.
Rising Fawn Furnace Co., Ga.

STAR LOCK WORKS.
ESTABLISHED 1836.

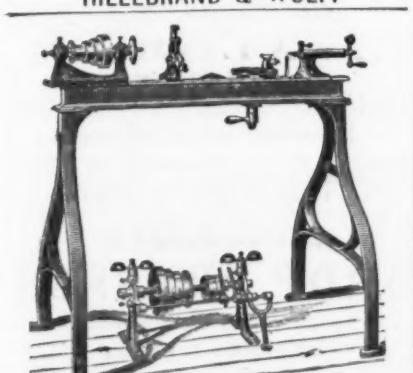
Trunk Locks, Pad Locks, Dead Latches, Door Springs, Trunk Stays, Keys, &c., &c.

110 South 8th St., and Sansom, bet. 8th and 9th, PHILADELPHIA.



PATENTED
Scand. Pad Locks
With Flat Keys.
Shackel secured to the Lock Box.

HILLEBRAND & WOLF.



ISRAEL H. JOHNSON, JR. & CO.,
TOOL & MACHINE WORKS,

Manufacturers of Engine, Brass Finishers', Wood Turners', Amateurs' and Jewelers' LATHES. Slide Rest, Screw Machines, Terret Heads, Screw Presses, Screw Clamps, Lathe Carriers, &c.

440 N. 12th St., above Noble, Philadelphia, Pa.
Israel H. Johnson, Jr., *Joshua R. Johnson, Jr.*

THE "DAISY" LAWN MOWER.

We are ready to supply the trade with the
Cheapest and Best Mower now in the Market.

Every machine unconditionally warranted. It has an adjustable vibrating handle, perfectly adapted for Terraces, Slopes and every variety of Lawn.
EVERYBODY CAN AFFORD TO BUY THE "DAISY."
Manufactured in four sizes, for hand use.
Liberal discount to the trade.

PAGE, FARGO & CO.,
325 Broadway New York.

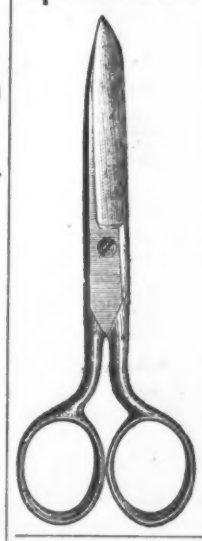
VERMONT SNATH CO.,
Manufacturers of
Pat. Swing Socket Snaths
and also a large variety of other styles of Snaths
Springfield, Vermont.
Represented in New York by Lamson & Goodnow Mfg. Co.

SMYTHE'S PATENT
WIRE FENCE NAIL.

Admitted by those who have used them to be the best thing made for fastening WIRE FENCE, being infinitely superior to the ordinary Staple, and is of the same weight. Drives into Hard Wood as well as into Cedar posts without crippling. Farmers give them a try! Railroads use your old ties for posts! We make a nail long enough to go into the Sound Wood. Ask your nearest dealer for them, or address the sole manufacturers,

WAREHAM NAIL CO., Edgar Robinson, Prop. } So. Wareham, Mass.

THE TURNER & SEYMOUR MFG. CO.
WOLCOTTVILLE, CONN.,
MANUFACTURERS OF
Upholsterers', Stationers', House Furnishing & Fancy HARDWARE AND NOTIONS.



The Turner and Seymour Mfg. Co. have been longer in the business and make a greater variety of **Cast Iron Scissors and Shears** than any other concern in the world. Our

"AMERICAN" SHEARS

have long been conceded to be the best ever made. The quality and finish of these goods shall always be maintained.
To meet the demand for a cheaper line we offer the trade our

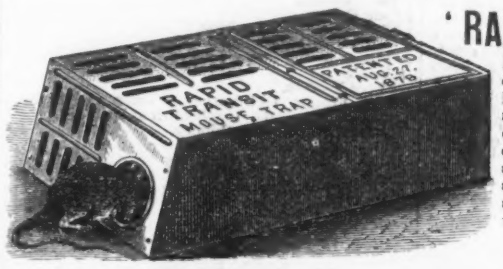
"CLIPPER" SHEARS.

On these we cannot be undersold. Price is about 25 per cent. less than the "American."

We are now making a fine line of cheap

Nickel Plated Scissors and Shears, Nut Picks, Nut Crackers, Fruit Knives &c.

Price Lists furnished on application.



Patented August 27, 1878.

THE
'RAPID TRANSIT' TRAP

Has no superior, and is a sure and certain catcher of Mice. With the Metal Platform resting on wood bottom of Trap, an invitation is always extended to Mice of whatever "kind, color or condition of race," into secure and grated quarters, from which they are released by opening cover of Trap and depositing contents into a pail of water.

The Mice go in at a rapid rate,
And each one sets it for his mate.

Manufactured by
THE SMITH & EGGE MANUFACTURING CO., Bridgeport, Conn.

J. STEVENS & CO.,
Chicopee Falls, Mass., P. O. Box 224,
Manufacturers of
SPRING CALIPERS AND DIVIDERS

Also, Surface Gauges and Counter Sinks, Stevens' Patent Breech-Loading Sporting Rifles, double and single barrel; Shot Guns, Pocket Rifles, Pocket Pistols, and the noted Hunters' Pet Rifles. Our

SHOOTING GALLERY RIFLE

Is the favorite everywhere.

Torrey's Door Springs.
S. ROEBUCK & CO.,
Manufacturers,

164 Fulton St., NEW YORK.

Torrey's Patent
COG WHEEL
Ice Cream Freezers.
Torrey's Door Springs.

S. ROEBUCK & CO., Manufacturers.
164 Fulton St., New York.

One Each STOCK, COLLET, DIE and TAP used in

LITTLE GIANT Screw Plates.
MADE BY
Send for prices.
WELLS BROTHERS & CO., Greenfield, Mass.

HANDLES FOR MANUFACTURERS.
From Selected Stock, Thoroughly Seasoned, Well Made.
Orders solicited from close buyers who want good work.

RIPLEY MANUFACTURING CO.,
Unionville, Conn.,
Manufacturers of
Common Mouse Traps, Porcelain-Lined Lemon Squeezers and House Furnishing Ware.

H. H. COLES & CO.,
446 North Twelfth Street, PHILADELPHIA.

NEW CHUCKING DRILL REST.
It will hold all sizes of drills up to 1¼ inches. Price 60 Cents.

REMOVAL.
Please notice that we have removed from No. 295 THIRD AVENUE to
No. 37 Warren Street, near Church St.,
Where we hope to be favored with a continuance of your generous patronage.

J. M. FARRINGTON & CO.,
Successors to DAY, FARRINGTON & CO., Manufacturers of
LOCKS, KNOBS, GONGS, BLANK KEYS,
Wrought Store Door and Flush Bolts, Silver Plated, Ornamental Bronze and other Hardware.

ICE BREAKERS.

The best for Beef and Fish Packers, Hotels, Confectioners, &c.
Send for circulars to

J. S. L. WHARTON, 15th and Wood Sts., Philadelphia.

TRENTON LOCK & HARDWARE CO.,
TRENTON, N. J.
MANUFACTURERS OF
DOOR LOCKS AND HARDWARE,
BRONZED IRON AND BRONZE METAL DOOR TRIMMINGS, BUTTS AND HARDWARE.

CAST BUTTS, DOOR BOLTS, WELL WHEELS, FLUSH BOLTS, SHUTTER BOLTS, PAD LOCKS,
BARN DOOR HANGERS, & RAIL, GRINDSTONE FIXTURES, SCREW & SIDE PULLEYS, NOISELESS PULLEYS, HAY FORK PULLEYS, SHELF BRACKETS,

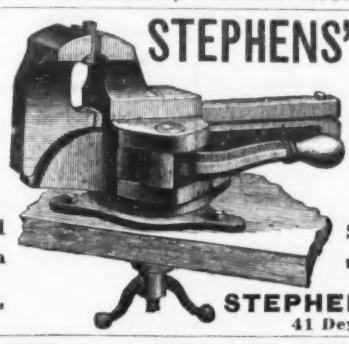
PHILADELPHIA SLIDING DOOR HANGERS AND RAIL.

Having largely increased our facilities and line of goooods, we invite the attention of the Trade.

Illustated Catalogues Furnished on Application.

Agencies. { James M. Vance & Co., No. 211 Market St., Philadelphia. / James Marshall, No. 48 Warren St., New York.

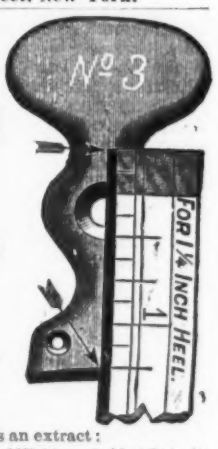
STEPHENS' PAT. VISE.



Stationary and Swivel Bottoms.
The Best in the Market.
For Sale by the Trade.

STEPHENS PAT. VISE CO.
41 Dey Street, New York.

Office of NELSON LYON,
SOLE MANUFACTURER OF
Lyon's Patent Metallic Heel Stiffeners,
Also, Manufacturer of
BRUSHES
Of Every Description,
Nos. 17 & 19 Green St.,
Albany, N. Y., Dec. 8, 1880.



To All Whom it May Concern:

To-day a decree in my suit against G. T. Fisher & Co., of Detroit, for an infringement of my patent, was made and entered, of which the following is an extract:

At a session of the Circuit Court of the United States for the Eastern District of Michigan, held at Detroit, &c., on Wednesday, the 8th day of December, 1880. Present, Hon. H. B. Brown, District Judge.

NELSON LYON *against* GUYON T. FISHER, *et al.*

It is ordered, adjudged and decreed, that the act entitled "An act for the relief of Nelson Lyon and Jeremiah S. James," passed by Congress and approved April 1, 1880, &c., is a good, valid and constitutional act.
That the original patent, bearing date July 9, 1872, and numbered 128,843, granted and issued to Joseph Barsaloux, Jeremiah S. James and Nelson Lyon, when corrected by the Acting Commissioner of Patents, as directed by said act, was a good and valid patent.
That the said Joseph Barsaloux was the original and first inventor of the improvements in metallic stiffeners for boot and shoe heels mentioned and described in said letters patent.
That the Reissued Letters Patent No. 9168 dated May 11, 1880, granted to said Nelson Lyon for an improvement in metallic heel stiffeners for boots and shoes, originally patented as aforesaid, is a good and valid patent; that said Lyon is exclusively possessed of said Letters Patent and the invention thereby secured.
That the defendants, G. T. Fisher & Co., and each of them, have infringed upon the said patents and upon the exclusive rights of said Lyon under the same.
That said Lyon receive of said defendants all the profits, &c., they have made, and in addition thereto all the damage he has suffered by reason of the infringements by the defendants, and also the costs, charges and disbursements in the action.
It is also further ordered, adjudged and decreed, that a perpetual injunction be issued against said defendants, according to the prayer of the said complainant's bill.
You are also hereby notified that the perpetual injunction has been issued and served on the defendants.

All questions as to damages and settlements in relation to infringements under my patents must be addressed to and made with my attorney, WILLIAM H. KING, in my care, at the above address.

NELSON LYON.

EXCELSIOR LAWN MOWER

Side Wheel Pattern.

Roller Pattern.

We make *Seven Sizes* of *Roller Mowers* and *Six Sizes* of *Side-Wheel Mowers.* We claim for our Mowers

Perfect Work, Light Draft and Simplicity.

We have received many first premiums in competitive trials with other Mowers, both in this country and a road. We have special patterns of Mowers for export, meeting the requirements of every market. Our new Horse Mower is conceded to be the *Lightest* and *Best* Horse Lawn Mower ever made. N. B.—Horse and Hand Lawn Mowers are alike guaranteed in all respects. Send for Illustrated Catalogue. Address

CHADBORN & COLDWELL MFG. CO.,
Newburgh, N. Y.

Broken Contracts.—The Buffalo *Express* says: The papers in six suits against the Union Iron Company, of this city, were served on the officers of that company last Saturday The actions grew out of a number of contracts made by Mr. George Beals, general manager of the iron works. It appears from the complaints in the cases that Mr. Beals last fall went to Cleveland and closed a contract with Mr. George C. Bingham for 10,000 tons of iron ore, for half of which $9.50 a ton was to be paid, and for the remainder the price was placed at $8.25. The ore was to be mined at Marquette, Mich. Following this agreement he signed a contract with Mr. George C. Finney, of Chicago, owner of the schooner J. Bigler; another, Merrick, Fowler & Essyltine, of Detroit, owners of the schooners Merrick and Montana; George Berriman, of Sharon, Pa., owner of another schooner, and David Muir, of Chicago, owner of the schooner Margaret A. Muir, by which these vessels were chartered to carry the ore in question to Buffalo for the season at $3.25 per ton. The last contract was with Samuel Fraser, of Kingston, Ontario, owner of the schooner Brooklyn, chartering that vessel to carry ore from Escanaba to Buffalo for the season at $2.40 a ton. Soon after the making of the contracts the price of ore fell, and when the first load came to Buffalo the Iron Company refused to receive the cargo, to take any of the ore or to employ any of the vessels. All of the parties referred to have begun suits against the company, Mr. Bingham for the difference between what he got for his ore and the price named in the contract, which he places at $20,000. The vessel men ask for the sum representing the difference between what their vessels actually earned and what they ought to have obtained if Mr. Beals had adhered to his agreement. The sums asked are nominally about as follows: Mr. Berriman, $5666; Messrs. Merrick & Co., $7000; Mr. Finney, $9000; Mr. Muir, $8000, and Mr. Fraser, $5000.

They want the 1883 Exhibition out West. The St. Louis *Globe Democrat* says: "The star of empire which has so long taken its way westward, pauses over the Mississippi Valley to await the grandest development of the human race. There is a destiny to be worked out in this incomparable valley which cannot now be foreshadowed, but which, it is felt everywhere, must shape the future of mankind for ages to come. In this great valley, and on the banks of its great river, now assuming a commercial importance commensurate with its position, any display in which the whole world is invited to compete should be located. * * * Chicago is of such a mushroom growth, and is so completely the child of speculation, that she represents nothing that is not temporary. She has the appearance of having arrived where she is by rail, and strikes the traveler as a huge consignment whose value cannot yet be definitely determined." Chicago, on the other hand, affects a supreme contempt for St. Louis, and is no less clamorous in her own behalf. New York must look out for her laurels, or these Western cities will take them.

A Southern planter writes to Boston respecting a combination cotton picker with fingers of iron, which is the beginning of a revolution in cotton growing. He believes it will lessen the price of cotton two cents a pound. The machine, by means of beaters and fans, takes the fiber from the ball, removes the seeds and all impurities, finally delivering it straightened, ready for the bale. Efforts are making to develop the invention in season for the exhibition at Atlanta.

Trade Report.

Office of THE IRON AGE,
WEDNESDAY EVENING, March 23, 1881.

Wall street all through the week under review has remained dull, in the absence of a specu'ative feeling. A repetition of contradictory reports from Washington respecting the call of an extra session, has been the chief source of disquietude. Fluctuations consequently were without significance, and transactions unimportant. The stock market was variable until Monday, when weakness was more perceptible, the decline being ½ @ 6½ per cent. Early in the week the leading drawers of Sterling advanced their posted rates one-half a cent, to $4.81½ and $4.84, followed by a reduction of one cent for 60-day and demand bills respectively. Coal shares were most active, but generally at lower prices, both for Delaware and New Jersey Central. For call loans the ending rate at the Stock Exchange was 5 @ 6 per cent., the latter rate being an exception. Another $500,000 arrived from Europe today, and probably $7,000,000 in addition is on the way.

The importations of specie and bullion at this port for the week ending March 18, amouted to $663,781, comprising $604,680 in gold and $51,101 in silver, as against a total of $271,684 for the week ending March 20, last year. The importations since the 1st of January and since the 1st of August compare as follows with the movement during the corresponding periods last year:

	Since January 1— 1881.	1880.
Gold	$6,886,382	$1,130,188
Silver	703,773	1,325,496
Total	$7,590,155	$2,455,674
	Since August 1— 1880-81.	1879-80.
Gold	$75,165,350	$76,158,150
Silver	3,175,124	4,303,010
Total	$78,340,474	$80,461,160

Government bonds, as noted, were firm, 4s and 4½s advancing ¼ each. Railroad bonds were irregular, several of the favorites first advancing and then receding in subsequent transactions. Part of the decline was afterward recovered. The most active stocks were the coal shares, Canada Southern, Western Union Telegraph, Pacific Mail, Milwaukee and St. Paul, Lake Shore and Iron Mountain.

As the week closes, money is easy at the Stock Exchange at 5 per cent. Exchange sluggish at $4.80½ for bills and $4.83 for cable transfers, rates being kept down by heavy exports of cotton from Southern shipping ports. In railroad bonds there is a large business in Hartford and Erie at 60¾ @ 61⅛. Chattanooga fancy is for the moment tossed wildly by bulls and bears.

The following is an analysis of the bank tota's of this week, compared with that of last week:

	March 12.	March 19.	Comparison
Loans	$296,252,900	$300,177,300	Inc. $3,924,400
Specie	55,868,000	59,552,000	Inc. 3,684,000
Legal t'd'rs	12,466,600	12,241,200	Dec. 225,400
Tot. reserve	68,334,600	71,793,200	Inc. 3,458,600
Deposits	271,666,800	277,931,600	Inc. 6,262,800
Reserve required	67,917,200	69,482,900	Inc. 1,565,700
Surplus	417,400	2,310,300	Inc. 1,892,900
Circulation	15,466,100	15,771,100	Inc. 305,100

FOREIGN IMPORTS.

For the week ended March 18:

	1881.	1880.	1879.
Total for week	$9,482,370	$11,724,781	$5,803,558
Prev. reported	79,976,492	97,319,870	66,273,942
Since Jan. 1	$89,458,860	$109,031,651	$72,077,500

Included in the imports of general merchandise for the week were articles valued as follows:

	Quantity.	Value.
Brass goods	31	$4,614
Bronzes	11	1,708
Chains and anchors	26	875
Copper	..	9,098
Cutlery	126	44,591
Pins	2	432
Guns	150	14,760
Hardware	9	1,359
Iron, pig, tons	4,212	64,991
Iron, sheet, tons	49	3,139
Railroad bars	4,871	67,535
Iron cotton ties	1,910	1,113
Iron tubes	121	87
Iron ore, tons	1,307	5,287
Iron, other, tons	1,125	33,785
Machinery	79	7,996
Metal goods	248	22,779
Needles	21	7,707
Old metal	..	2,686
Ore	60	4,100
Platina	5	7,489
Plated ware	3	255
Percussion caps	1	188
Saddlery	6	1,031
Steel	30,562	133,129
Silverware	9	2,831
Tin, boxes	12,004	54,544
Tin, 302 slabs; 21,156 lbs	..	4,219
Wire	95	9,402
Zinc	41,343	1,673

EXPORTS OF SPECIE.

For the week ended March 18:

Total for the week	$292,778
Previously reported	2,447,080
Total since January 1, 1881	$2,739,858
Same time in 1880	2,814,054
Same time in 1879	4,697,558
Same time in 1878	2,913,655
Same time in 1877	3,343,605
Same time in 1876	11,630,959
Same time in 1875	15,686,346
Same time in 1874	7,532,874
Same time in 1873	13,520,391
Same time in 1872	4,613,385

EXPORTS, EXCLUSIVE OF SPECIE.

For the week ended March 22:

	1879.	1880.	1881.
For the week	$5,900,575	$2,146,413	$7,800,595
Prev. reported	60,093,817	62,454,047	75 718,991
Since Jan. 1	$65,994,932	$70,600,460	$83,519,586

Government bonds at the close were quoted as follows:

	Bid.	Asked.
U. S. 6's 1881 registered	102½	102¾
U. S. 6's 1881 coupon	102⅛	102¼
U. S. 5's 1881 registered	101¾	101½
U. S. 5's 1881 coupon	101¾	101½
U. S. 4½'s 1891 registered	111½	111¾
U. S. 4½'s 1891 coupon	111½	111¾
U. S. 4's 1907 registered	112⅜	112½
U. S. 4's 1907 coupon	113⅜	113½
U. S. Currency 6s 1895	130	—
U. S. Currency 6s 1896	130	—
U. S. Currency 6s 1897	130	—
U. S. Currency 6s 1898	130	—
U. S. Currency 6s 1899	130	—

The stock market closed at the following quotations:

	Bid.	Asked.
Arizona	4⅞	5
Atlantic and Pacific Telegraph	45⅛	46½
American District Telegraph	63½	64
Alton and Terre Haute	42½	44
" " " Pref	123½	126
Burlington and Quincy	162¼	162½
Bur., Cedar Rapids & North	70	72
C. C. and I. C.	23⅝	23⅞
Colorado Coal	49	50
Central Pacific	84½	85
Canada Southern	78⅜	78⅝
Chicago and Alton	137	138
Cedar Falls	22	24½
Chicago, St. Louis and New Orleans	69¼	70½
Consolidated Coal	33	30
Chesapeake and Ohio	23	24
" " 1st Pref	34¼	35½
" " 2d Pref	25¾	26
Cin., Sandusky and Cleve	55	56
Caribou	2⅛	2½
Delaware, Lack. and Western	118¼	118⅜
Delaware & Hudson Canal	107¼	107½
Denver and Rio Grande	101½	101¾
Deadwood	10	11
Erie	45⅝	45¾
Erie Pref	84	85
Erie and Western	51	52
Excelsior	5	5½
Express—Adams	128	129½
" Wells, Fargo	117	119
" American	71½	72
" United States	57	58¼
Homestake	20½	27½
Houston and Texas	65	—
Hannibal and St. Joseph	53¼	53½
" " Pref	100	100⅛
Illinois Central	132½	133
Indiana, Bloom. and Western	—	71
Int. and Great Northern	66	69
Iron Mountain	62½	62¾
Kansas and Texas	43¾	43½
Keokuk and Des Moines	16	17¾
" " Pref	41	46¼
Lake Shore	126⅝	126¾
Louisiana and Missouri	..	27
Louisville and Nashville	90¾	90½
Louisville, New Albany and Chic	70	72½
Little Pittsburgh	3⅝	3½
Mobile and Ohio	22⅞	23
Marietta and Cincinnati Pref	10½	11⅛
Maryland Coal	25	27
Manhattan Elevated	37⅞	38
Mil., Lake Shore & West	43⅜	44
Michigan Central	110⅞	110⅞
New York Central	142¾	143
Northwest	121¾	121¾
" Pref	132½	133
New Jersey Central	96½	96⅝
Northern Pacific	41⅜	44
" Pref	67¾	68
New Central Coal	27	28
Nashville and Chattanooga	82½	83½
Metropolitan Elevated	112	113½
New York Elevated	122	124
Ohio	42½	42⅝
Omaha	40½	41
" Pref	98¾	98¾
Ohio Central	30⅛	30⅜
Ontario and Western	34⅝	34⅝
Peoria, Decatur & Evansville	36¾	37½
Ontario Silver	36½	37½
Oregon Navigation	150	154
Pacific Mail	54½	54¾
Panama	212	228
Quicksilver	14⅛	15
" Pref	..	61½
Rome, Watertown and Odgenburg	25	28
Reading	58	58¼
Rock Island	132	133¼
St. Paul	109½	109⅝
" Pref	121	121½
Standard	25	25½
Silver Cliff	4⅞	5
Stormont	2⅛	2¼
Sutro Tunnel	1⅜	1¾
Union Pacific	116¼	116½
Texas Pacific	52¾	53
San Francisco	..	41
" Pref	..	63½
" 1st Pref	93½	93¾
Wabash and Pacific	44⅜	44⅝
" Pref	85¾	86
Western Union Telegraph	113	113⅛
Western Union Telegraph, ex div	78¼	..

MINING STOCKS.

The following were the closing quotations:

	Bid.	Asked.
Amie	49	50
American Flag	28	30
Bell Isle	55	60
Bechtel	58	60
Bonanza C	28	30
Buckeye	19	20
Bull Dom	2.55	2.60
Bulwer	2.00	2.10
Boulder	80	82
Calaveras	20	22
Cale. B. H	1.35	1.45
California	95	1.00
Climax	63	64
Consolidated Virginia	1.60	1.65
Consolidated Imperial	12	13
Consolidated Pacific	75	80
Chrysolite	6.37½	6.50
Cherokee	2.10	2.15
Dunkin	....	1.20
Dahlonega	7	9
Durango	16	18
Findley	26	30
Fa. DeSmet	10.25	....
Great Eastern	28	29
Gold Placer	40	50
Gold Stripe	3.20	3.25
Goodshaw	82	84
Granville	4	5
Green Mountain	6.37½	6.62½
Hukill	1.25	1.30
Hibernia	83	84
Iron Silver	3.50	3.60
Lacrosse	27	29
Leadville	90	93
Lucerne	13	14
L. Chief	1.35	1.40
Little Pitts	3.35	3.45
Mariposa	4.00	4.35
North Star	19	21
Red Eleph	29	31
Rappah'k	14	15
R. Sun	3.05	3.10
Silver Cliff	4.75	4.85
Sutro	1.65	1.70
Spr'g Va!	2.85	....
Unadilla	14	15
Willshire	1.50	1.60

GENERAL HARDWARE.

Although severe snow storms in the West have occurred since our last writing, further demoralizing transportation facilities and greatly retarding business, trade here keeps up remarkably well. The effect of the long continuance of winter is noticeable, however, in the department of Builders' Hardware, and no improvement can reasonably be expected until we are favored with milder weather.

Russell & Erwin Mfg. Co. have a cable from their agent at the Melbourne Exposition, advising that they have received the three highest awards for Door and Pad Locks, Artistic Bronze and other Door Trimmings, and Builders' Hardware generally. Also, that the Douglass Mfg. Co. have received the highest award for goods of their manufacture, including Chisels, Drawing Knives, Augers, Auger Bits, Hollow Augers, Boring Machines, &c.

At a meeting of Lock manufacturers, held at New Haven, Conn., to-day, it was unanimously resolved that the prices, discounts and terms of sale adopted December 1st, 1880, are hereby confirmed and continued.

The demand for Nails, though not active, was better than during the preceding week, and the tone of the market is firm. We quote 10d. to 60d. $3 @ $3.10, net, according to quantity.

We have received from the Secretary of the Association of Manufacturers of Tinned and Enameled Hollow Ware, the following regarding their late meeting: "A stated meeting of the Association of Manufacturers of Tinned and Enameled Hollow Ware, comprising all the makers of Cast Iron Ware in this country, was held at the Lochiel House, Harrisburg, on the 16th of March. Some matters of much interest to the members were discussed, and it was resolved that the present prices of this class of goods should be retained."

The National Horse Nail Co., Durrie & McCarty, agents, have placed on the market a new line of goods, which they style "Champlain" Forged Horse Nails, of which they say, "They are made from the best brands of Swedish Iron only, and are warranted to give perfect satisfaction. They have the uniformity of Machine Nails and the toughness of those hammered by hand." The following is the list price, which is subject to discount 10 per cent.; for wholesale lots an extra discount is allowed:

CHAMPLAIN FORGED HORSE NAILS.

Nos	5	6	7	8	9	10
Per lb	28	25	23	22	21	20¢

The National Tube Works Co. announce to the trade that on and after March 18, 1881, the discount on their standard quality Wrought Iron Pipe will be 65 per cent. and 5 per cent. on carload lots and over, and 65 per cent. on smaller quantities.

Flagler, Forsyth & Bradley, No. 87 Chambers street, illustrate, in their advertisement on the 9th page, McElhaney's Combined Pruning Shears and Hedge Trimmer, to which we invite attention. They quote these goods $18, net, per dozen.

Logan & Strobridge, of New Brighton, Pa., have just perfected and are offering to the trade their new Franco-American Coffee Mill, an illustration of which appears in their advertisement on page 26. The design, as will be noted from the cut, is neat and the construction strong and substantial. In their circular they say: "The box is made of clear poplar wood, thoroughly seasoned, and dovetailed and glued together, the top being strengthened by cross pieces glued on the under side. The grinding parts are of the hardest chilled iron. The cover and hopper are fastened to the box by round-head screws 1½ inches long, which pass through the top and down into the sides. The regulator, for grinding fine or coarse, is strong and substantial, and as simple as anything can be ma'e. The box is covered with best Copal varnish, and the iron parts are finished in copper bronze." Three sizes are made—5 by 6 inch box, 5½ by 6½, and 5½ by 7.

Crandal, Stone & Co., Binghamton, N. Y., invite the attention of the trade to their "Favorite" Curry Comb, manufactured under Norton's patent, the peculiar feature of which is its rounded malleable iron teeth, which they claim cannot cut or tear the flesh of the animal. An illustration of this Curry Comb appears in their advertisement on page 26. We are informed that these goods can be sold at the same price as the regular goods.

E. M. Boynton, patentee of the "Lightning Saw Tooth," informs us that his new Saw factory in Brooklyn, 100 by 90 feet, is now completed. When all the machinery is in motion, he estimates his capacity as over 1000 Saws per day, including all kinds. Shipments will be made as usual from his warehouse, No. 80 Beekman street, where a full assortment of Saws of all kinds is kept in stock. The discount off the list for Boynton's Circular and Mill Saws has been changed to 40 per cent., formerly 25 per cent., and Patent Cross Cuts, One Man Saws, Billet Webs and Patent Handles, 30 per cent., instead of 25 per cent., as formerly.

BRITISH IRON MARKET.

[*Special Report by Cable to The Iron Age.*]

LONDON, March 23, 1881.

Scotch Pig.—The market remains dull, with prices weak and demand light. The following are to-day's quotations, showing a decline of 1/ in Gartsherrie and 6d. on the other brands:

Gartsherrie, alongside, Glasgow	58/
Coltness " "	58/6
*Glengarnock " Ardrossan	55/6
*Eglinton " "	49/6

Manufactured Iron.—There is but little business, and prices are nominal. Best Staffordshire Bars, nominally, £7 @ £7. 5/.

Steel Rails.—Transactions have been large and prices are steady. Ordinary sections are quoted £6. 10/ @ £6. 15/.

Iron Rails—Are in good demand and a large business has been done during the week. Prices are firm. We quote Welsh, £5. 5/ @ £5. 10/.

Old Rails.—Nothing doing. Prices nominal. Old Ts, £4. 7/6.

Scrap.—No business doing.

*Lighterage from Ardrossan to Glasgow is 2/ @ 2/6 per ton.

IRON.

American Pig.—The Iron market presents a very quiet appearance at present. Sales are light and there is not much inquiry; still consumption continues on an enormous scale, and, as we remarked last week, deliveries on contracts closed earlier in the year are being steadily made. The tone of the market is decidedly strong, and we continue to quote Foundry No. 1, $25 @ $26; Foundry No. 2, $22 @ $23; Gray Forge, $20 @ $21. A sale of 500 tons 2 X, a Lehigh brand, at a price equivalent to $22 here, is reported.

Scotch Pig.—Sales are reported of 1000 tons Glengarnock on private terms, and about 500 tons Carnbroe and Glengarnock, in lots, at $22 @ $23. The market lacks animation, but prices are not quotably lower. We quote Eglinton, $22; Carnbroe, $22.50 @ $23; Coltness, $24.50 @ $24.75; Glengarnock and Gartsherrie, $23 @ $23.50.

Rails.—The demand for both Steel and Iron Rails continues active, and we hear of sales of 500 tons foreign Steel Rails from store and 10,000 tons to arrive; also, about 4000 tons English Iron Rails, all on terms which have not transpired. A sale is also announced of 10,000 tons Steel Blooms for shipment during the summer months, on private terms. We quote, nominally, Steel at mill, $62 @ $65, and Iron Rails, $48 @ $50 for ordinary sections.

Old Rails.—For Old Rails there is not much inquiry, although some of the transactions which were pending when we last went to press have since resulted in business, and sales are announced of 1000 tons Ts, for shipment to an interior point, at a price said to be equivalent to $28.50 at New Orleans; also, 500 tons Ts, to arrive, at $27.50; 500 tons, on the spot, at the same price, and 500 tons, to arrive, Philadelphia delivery, at $27.75. We quote: Ts, $27.50 @ $28, and D. H., $28.50 @ $29.

Scrap.—The business in Wrought Scrap is light, and no transaction worthy of mention has come to our notice during the week. We quote No. 1 Wrought, nominally, $30 @ $31.

METALS.

Copper.—The market since our last report has been quiet, only 150,000 pounds Lake selling at 19⅛¢ @ 19¼¢, which is also the closing quotation. London cables Chili Bars, £61. 10/, and Best Selected, £68. The import of Copper, &c., into the Uunited States during the calendar year has been:

	1880	Value.
Copper ore, cwts	61,771	$212,286
Ingots, &c., lbs	4,540,671	705,085
Copper manufactures	....	416,776
Total		$1,334,147
	1879	Value.
Copper ore, cwts	25,586	$61,756
Ingots, &c., lbs	1,123,428	163,228
Copper manufactures	....	331,217
Total		$556,201

And the export:

	1880	Value.
Copper ore, cwts	18,647	$67,054
Ingots, &c., lbs	326,152	63,161
Copper manufactures	....	39,871
Cartridges	....	598,627
Total		$788,713
	1879	Value.
Copper ore, cwts	13,437	$47,839
Ingots, &c., lbs	13,402,332	2,043,529
Copper manufactures	....	123,942
Cartridges	....	457,474
Total		$2,672,724

According to the *Cronica de la Industria*, Madrid, Feb. 28, the export of Copper and Copper Ore from Spain has been:

	1880 Tons.	Francs.
Copper, in bars, slabs, &c	20,995	20,467,265
Copper ore	501,425	35,942,261
Total	522,420	56,409,526
	1879 Tons.	Francs.
Copper, in bars, slabs, &c	20,834	17,240,425
Copper ore	459,576	34,908,372
Total	480,410	52,148,797

Manufactures remain as under: Bottoms, 29¢; Braziers, according to size, 28¢ @ 34¢; Circles, 31¢ @ 34¢; Segment Sheets, 31¢; Fire-box Sheets, 28¢; Sheathing, 26¢, and Bolt Copper, 28¢.

Tin.—Our market is very steady with somewhat better prices. About 150 tons of Straits have been sold at 20¢, mostly for cash, and there is a good daily jobbing demand at 20¼¢. The London market is firm, but unchanged. Considerable Tin seems to be held at New York by outside parties and is expected to come forward at the next rise in price, a circumstance which operates against the metal. We quote at the close upon a quiet but firm market, Straits, Billiton, Australian and English Common, large lines, 20¢ @ 20¼¢. The import of Tin into the United States during the calendar year 1880 has been 13,346 tons, worth $6,120,316, against 10,186 tons, worth $3,605,614, the previous year. *Tin Plates.*—Although the Western trade is backward, Plates have been firmer, with a good demand. The improved prices ruling are due to better advices from Liverpool, stating that many makers are in trouble. It seems that the only thing keeping the market from going up is the large stocks at Liverpool, from which we are now drawing heavily. The reduction in the make is put down at about 50,000 boxes per week, while we are drawing from the Liverpool stock at the rate of about 25,000 boxes weekly. The stock here is much cut up, and parcels arriving are distributed from dock. Prices in England have advanced 6d. to 9d. per box, and makers now firmly cling to 16/, as there have been some failures; however, some cash parcels are occasionally offered at low prices, ranging between 14/9 and 15/, as low as 14/6 being accepted in one case. On taking a general view of the tin trade situation, it may be asserted that the tone in England is stronger than it is here. We quote at the close, large lines, ordinary brands, per box: Charcoal Bright, $5.87½ @ $6.25; Ditto Ternes, $5.35 @ $5.50; Coke Tin, $4.90 @ $5.12½; and Ditto Ternes, $5. The import of Tin Plates into the United States during the calendar year 1880 has been 3,160,976 cwts., worth $16,518,113, against 3,085,014 cwts., worth $15,227,659, the previous year.

Lead.—The market has been very dull and weak, with very little doing. Sales have been effected of 200 to 300 tons at varying prices, from $4.62½ to $4.70, which is the range at the close for Common Domestic. Refined has been equally quiet without anything transpiring; we quote the same, $4.87½ @ $4.90. The import of Pig Lead into the United States during the calendar year 1880 has been 2884 tons, worth $252,082, against 1633 tons, worth $120,052 the previous year. The export of Pig Lead from Spain, in 1880, has been 92,400 tons, worth 45,169,829 francs, against 100,336 tons, worth 50,549,120 francs the previous year. In other words, the excess of production in 1879 over 1878 has disappeared again in 1880. There is no change in Lead abroad. Manufactures are quoted as follows: Sheet Lead, 7¢; Lead Pipe, 6½¢; Tin lined ditto, 15¢, and Block Tin Pipe, 40¢.

Spelter and Zinc.—The dull state of affairs here continues, nor can we quote Common Domestic any better than 5¢ @ 5⅛¢., while Silesian is altogether nominal. The import of Spelter into the United States during the calendar year 1880 has been 2750 tons, worth $294,193, against 1908 tons, worth $180,365 the previous year. Of Sheets the domestic export has been 1,737,711 pounds, worth $154,817. against 1,236,150, worth $102,787. *Sheet Zinc* is worth at New York 7¢. Spanish exportation of Calamine in 1880, which, we believe, goes to England exclusively, has been 32,401 tons, worth 1,786,995 francs, against 27,613 tons, worth 1,507,781 francs, in 1879.

Antimony—Has remained quiet. We quote: Hallet's and Johnson's, 14⅝¢ @ 14¾¢, and Cookson's brand, 14¾¢ @ 15¢.

IMPORTS

Of Hardware, Iron, Steel and Metals into the Port of New York, for the Week ending March 23, 1881:

Hardware.

Am. Bicycle Co.
Case, 1
Bliss E. A. & Co.
Package, 1
Boker Hermann & Co.
Arms, cs., 45
Cases, 107
Casks, 5
Packages, 60
Brown F. W.
Case, 1
Brown Bros. & Co.
Gal. wire, cks., 13
Burkinshaw W. C.
Cases, 3
Connelly T. J. & Bros.
Cases, 2
Curley & Bro.
Cutlery, cs., 4
Downing, Sheldon & Co.
Case, 1
Drexel, Morgan & Co.
Arms, cs., 26
Durand J.
Cylinders, cs., 12
Elliott A. H.
Mach'y, cs., 2
Folsom H. & D.
Cases, 8
Graef Cutlery Co.
Cases, 7
Hiller Ernest,
Scythes, bales, 11
Hartley & Graham,
Cases, 27
Howard Bros. & Read,
Casks, 8
Hoe R. & Co.
Case, 1
Irwin T. & Sons,
Packages, 6
Latham & Jeffries,
Cases, 2
Merchants' Dispatch Co.
Caps and cartridge cases, cs., 4
Moore's Sons J. P.
Arms, cs., 23
Caps and cartridge cases, cs., 10
Merwin, Hurlbert & Co.
Arms, cs., 10
Mount Jas. T.
Case, 1
Casks, 2
Peter Wright & Sons,
Gun barrels and fittings, case, 1
Pierson, Harriman & Co.
Cases, 3
Schaefer Anton,
Machine, case, 1
Schoverling, Daly & Gales
Cases, 9
Cartridge cases and gun caps, cs., 15
Shick Ernst,
Mach'y, cs., 10
Steinhardt A. & Bros.
Cases, 2
Thompson John,
Case, 1
Wall P. T.
Screw ends, lots, 81
Wiebusch & Hilger
Hdw. Co.
Packages, 75
Winchester Arms Co.
Guns, cs., 6
Irwin Thos. & Sons,
Cases, 18
Waterbury Clock Co.
Cases, 3
Order,
Casks, 17
Guns, cs., 5
Cases, 5
Anvils, 60
Ware, cast

Iron.

Anderson, Wright & Co.
Old rails, pcs., 714
Bank of Nevada,
Old rails, 2690
Barnstoff & Co.
Old, lbs., 50,000
Bausell & Co.
Plates, 45
Baring Bros. & Co.
Pigs, 200
Brown Bros. & Co.
Swedish, bags, 938
Carey & Moen,
Bundles, 214
Coddington I. B. & Co.
Sheet, bdls., 222
Duval H. R.
Packages, 16
Drexel, Morgan & Co.
Ore, tons, 930½
Pig, tons, 150
Blooms, 364
Elliott, Son & Co.
Ore, tons, 928
Giesenheimer & Co.
Spiegel, tons, 223
Irwin Richard & Co.
Pigs, 200
Lang W. Bailey,
Bars, 259
Latasa F.
Ore, tons, 676
Lee James & Co.
Pigs, 200
Merchants' Dis. Co.
Mach'y, cs., 13
Hunninghaus,
Nails, cks., 10
Irwin Thos. & Sons,
Chains, cks., 18
Pierson & Co.
Rolled wire, bdls., 989
Ruger Bros.
Ore, tons, 478
Waefelaer & Deysters,
Nails, cks., 74
Williamson Jas. & Co.
Pigs, 100
Worthington R.
Cases, 10
Order,
Heavy wro't scrap, lot
Heavy wro't scrap, tons, 100
Scrap, tons, 500
Wire rods, bdls., 149
Hoop, bdls., 400
Spiegel, tons, 150
Spiegel, lot, 1
Pig, tons, 920
Taggers, 100
Blooms, 936
Rails, 5807
Rails, Old, 6136
Ore, tons, 1072
Ore, kilos, 610,000

Steel.

Abbott & Co.
Cases, 23
Bundles, 155
Baring Bros. & Co.
Cross ends, tons, 200
Brown Wm.
Bundles, 341
Case, 1
Brown Bros. & Co.
Wire rods, rings, 168
Blake Bros. & Co.
Bundles, 155
Bruckner & Evans,
Gal wire netting, rolls, 178
Box, 1
Drexel, Morgan & Co.
Old R. R. spring, tons, 100
Steelware, cs., 8
Friedmann & Lauterjung,
Steelware, cs., 3
Kainah Cutlery Co.
Cases, 3
Lee James & Co.
Slabs, 67
Morris L. W.
Axes, cs., 3
Russell T. & Co.
Needles, cs., 6
Milliken & Smith,
Wire rods, bdls., 766
Struller, Lau & Co.
Cutlery, cask, 1
Temple & Lockwood,
Sheet, cs., 24
Bars, bdls., 37
Cast tires, 68
Tillotson L. G. & Co.
Wire, lots, 288
Tomlinson Spring Co.
Bundles, 139
Ward Asline,
Cutlery, cs., 6
Wells, Fargo & Co.
Cases, 6
Order,
Blooms, 8635
Wire, lots, 147
Scrap, tons, 157
Bessemer wire rods, lots, 4294
Rails, 6021
Rods, 1124
Tubes, 69
Tubes, cs., 4
Rods, bdls., 1179
Old spring, cks., 50
Old spring, tons, 129
Cases, 29
Casks, 5

Metals.

Alexandre F. & Sons,
Sheet zinc, pkgs., 18
Balsell & Co.
Old copper, bxs., 6
Old copper pipes, 92
Bank of Montreal,
Tin plates, bxs., 7351
Barttam Bros.
Old copper still, 1
Bruce & Cook,
Tin plates, 904
Byrne Jos. & Co.
Tin plates, bxs., 3849
DeCastro & Co.
Copper, pcs., 2
Laidlow & Co.
Lead, bars, 2834
Copper cement, pgs., 25
Mestro & Deritz,
Copper nails, bxs., 2
Phelps, Dodge & Co.
Tin plates, bxs., 3891
Pope, Cole & Co.
Copper, bars, 1461
Raupts ——,
Copper works, cs., 3
Zickendorf L. & Co.
Copper, bars, 679
Order,
Tin plates, bxs., 2253
Tin, slabs, 19
Lead, pigs, 767

EXPORTS

Of Hardware, Iron, Machinery, Metals, &c., from the Port of New York, for the Week ending March 22, 1881:

Stettin.

	Quan.	Val.
Ag imp., pkgs	225	$3,600

Danzig.

Ag. imp., pkgs	180	5,750

Christiana.

Ag. imp., pkgs	200	7,625

Danish West Indies.

Nails, kegs	72	267
Hdw., cs	45	400
Boiler	1	1,700
Ptlm., gals	5,520	704

Dutch West Indies.

Ptlm., gals	4,199	543
Sew. ma., cs.	3	29
Tinware, cs.	3	41
Hdw., cs.	11	239
Iron safe	1	100
Clocks, pkgs.	8	100

Hamburg.

Ptlm., gals	540,628	48,952
Ag. imp., pkgs	507	16,110
Mach'y, cs.	22	5,232
Clocks, bxs	117	2,316
Saw	1	100
Casings, tcs.	20	220
Hdw., cs.	116	4,400
Metal, cs.	14	600
Mf. iron, pkgs	128	1,178
Tinware, pgs.	9	342
Sew. ma., cs.	3	100
I R springs, cs	4	790

Bremen.

Ptlm., gals	757,407	156,091
Hdw., cs.	14	336
Ag. imp., pkgs	81	2,075
Pumps	3	81
Mf. iron, pkgs	26	1000
Mach'y, cs.	1	125

Antwerp.

Mf. iron, pkgs	5	75
Ag. imp., pgs.	41	1,922
Hdw., cs.	6	56

Liverpool.

Mf. iron, pkgs	23	568
Nick'l mt., bbls	20	2,500
Russia iron, cs	10	1,073
Pumps	3	102
Ag. imp., pkgs	601	11,000
Hdw., cs.	15	949
Sew. ma., cs.	10	168
Metalwe, cs.	1	300
Mach'y, pkgs.	121	13,055
Clocks, cs.	1	167
F plates, cs.	2	350

London.

Hdw., cs.	147	5,389
Ag. imp., pkgs	402	3,975
Car wheels	100	660
Mf. iron, pkgs.	22	666
Clocks, bxs.	141	6,905
Mach'y, cs.	45	2,500
Tinware, cs.	3	56

Bordeaux.

Ag. imp., pkgs	439	11,132

French West Indies.

Gla'sware, pgs	7	107
Mf. iron, pkgs.	2	140
Ptlm., gals	7038	914
Sew. ma., cs.	6	145
Mach'y, pkgs.	2	100
Ag. imp, pkgs	7	150

Cuba.

Hdw., pkgs	130	2,815
Ptlm., gals	3,800	480
Glassware, pgs	50	1095
Mach'y, pkgs.	93	7,661
Tin, cs.	9	229
Metal g'd'r, cs.	2	174
Clocks, cs.	7	157
S nails, bxs.	4	27
Tinware, cs.	4	103
Spikes, kegs	10	50
Nails, hhds	10	393
Brass tubes	60	150
Tacks, cs.	4	97
Hoops	88,000	2,844
Mf. iron, pkgs	109	1,730
Sew. ma., cs.	29	872
Pumps, pkgs.	2	109
Nails, kegs	197	603
Ag. imp., pkgs	80	2,772
Locomotive	1	4,000
T h'ops, bales	25	218
Boilers	2	4,525

Porto Rico.

Ptlm., gals	4000	500

Genoa.

Irons, cs.	29	95
Mach'y, cs.	3	554
Sew. ma., cs.	72	800

Palermo.

Sew. ma., cse.	2	40

Hayti.

Ptlm., gals	9,298	1,248
Nails, bxs.	60	123
C'ge g'ds, pgs	7	230
Mf. iron, pkgs	40	425
Hdw., pkgs	42	836
Shot, bxs	2	33
Iron bars	22	31
Clocks, cs.	3	580
Lead, pigs	13	100

China.

Mf. iron, pkgs	4	400

Mexico.

Mach'y, pkgs.	192	12,456
Pump	1	50
Clocks, bxs.	3	105
Cartridges, cs.	3	64
Carbines, cs.	1	25
Mf. iron, pkgs	230	1,378
Sew. ma., cs.	65	1,140
Barrows	8	100
Cutlery, cs.	25	1,442
Nails, kegs	427	1,722
Scales	4	1,300
Locomotives	4	33,000
Belting, cs.	3	770
Hdw., cs.	127	1,830
Ag. imp., pkgs	52	914
Revolvers, cs.	1	650
Arms, cs.	9	2,400
Caps, cs.	6	350
Chain, casks	3	274
Mf. steel, cs.	2	144
Cutlery, cs.	6	317

Central America.

	Quan.	Val.
Mf. iron, pkgs.	32	$976
Ptlm., gals.	710	100
Sew. ma., cs.	22	502
Mach'y, cs.	2	63
Tinware, cs.	12	184
Hdw., cs	34	775
Arms, cs.	5	136
Cartridges, cs	2	47
Nails, kegs.	73	279

United States of Colombia.

Cutlery, cs.	303	5,784
Mach'y, pkgs.	438	11,564
Cartridges, cs	206	3,656
Rifles, cs.	51	10,227
Clocks, bxs.	22	756
Pumps, pkgs.	6	67
Arms, cs.	7	268
Ag. imp., pkgs	44	589
Wh.& ax., pgs	6	131
Hdw., pkgs.	252	6,961
Sew. ma., cs.	149	3,979
Ptlm., gals.	2,560	425
Glassware, pgs	173	2,300
Mf. iron, pkgs	81	1,601
Nails, cs.	5	264
Revolvers, cs.	7	3,903
Windlass	1	48
Nails, kegs	38	246
Tinware, cs.	2	30
Iron, pkgs.	303	1,271
Copper, cs.	7	1,034
Ammuni'n, cs	1	70

Hull.

Clocks, bxs.	281	5,319
Ag. imp., pkgs	750	16,930
Hdw., cs.	6	134
Mf. iron, pkgs	7	290
Mach'y, pkgs.	123	1,812

Glasgow.

Mach'y, cs.	38	1,908
Clocks, pkgs.	29	594
Mf. iron, pkgs	2	127
Ag. imp., pkgs	91	1,214
Hdw., cs.	25	640

Bristol.

Ptlm., gals	354,598	36,069

Gibraltar.

Hdw., pkge.	1	22

British North American Colonies.

Ptlm., gals.	2,350	445
Pig iron, tons	146	2,265
Hdw., pkgs.	3	73
R R. wheels	22	324

British East Indies.

Ptlm., gals.	295,000	37,790

British Possessions in Africa.

Hdw., pgs.	39	483
Wire, bdls.	120	1,250
Sew. mach., cs	10	500

New Zealand.

Mf. iron, pkgs.	2	7

Passages.

Ptlm., gals.	125,870	10,909

British West Indies.

Sew. ma., cs.	25	463
Tinware, cs.	11	232
Mach'y, pkgs.	3	78
Nails, kegs	145	560
Cartridges, cs	6	155
Grindstones	8	46
Ptlm., gals.	37,472	4,923
Hdw., cs.	93	1,548
Mf. iron, pkgs	142	743
I safe	1	50
Pumps, pkgs.	5	127
Guns, case	1	180
Revolvers, cs.	4	125

British Honduras.

Ptlm., gals	2574	389
Mf. iron, pgs.	55	494
Cutlery, cs.	15	265
Hdw., cs.	2	66
Nails, kegs	14	67

Havre.

Copper, cbys.	2	150
Ag. imp., pkgs	46	2,100
Mach'y, cs.	1	185
Hdw., cs.	3	100
Cutlery, cs.	4	600

Venezuela.

Mach'y. pkgs.	94	2,255
Pump	1	343
Ptlm., gals.	5,650	792
Sew. mach., cs	10	395
I R goods, cs	3	106
Tinware, cs.	16	426
Mf. cop., box	1	20
Metal, cs.	3	145
Ptg. matl., pgs	11	526
Hdw., pkgs.	44	501
Mf. iron, pgs	6	173
Nails, kegs	56	160
Bar lead, cs.	2	87
Anch. &c., cs	2	93
Brass g'ds, cs	1	78

Brazil.

Ptlm., gals.	154,930	22,002
Rifles, cs.	3	246
Mach'y, pgs.	122	3,415
Nails, kegs	80	240
Sew. ma., cs.	294	4,107
Tinware, cs.	4	131
Springs, cs.	7	429
Bells, cs.	1	193
Tacks, cs.	12	315
Cutlery, pgs.	116	3,667
Cartridges, cs	2	37
I safe	1	165
Clocks, bxs	50	1,240
Guns, cs.	1	50
Mf. iron, pkgs	382	5,487
Hdw., pgs.	472	10,398
Nails, cs.	7	122
Ag. imp., pgs.	40	1,287
Pistols, cs	1	156
Locomotives	2	16,000
Revolvers, cs	1	120
Pumps, pkge.	1	108

Peru.

Ptlm., gals.	116,000	14,193
Hdw., cs.	20	707
Ag. imp., pgs.	164	1,551
Mf. iron, pgs.	110	1,164

COAL.

The past week has been eventful in Coal circles. Previous rumors of an agreement to restrict production were confirmed by the following notice issued to the Schuylkill operators, by a committee of the Schuylkill Coal Exchange: "The Anthracite Coal interests have agreed to the stoppage of Coal mining on the last three days of next week—that is to say, they will stop work on March 24, 25 and 26, and the last three days of the week following—that is to say, on March 31 and April 1 and 2. To carry out fully the spirit of the agreement, it is essential that the mining, hoisting, preparation and loading of Coal during those days be entirely discontinued, and it is earnestly hoped that the above agreement for suspension will be carried out by every one in perfect good faith." This arrangement is not necessarily for a definite period, the purpose being to observe the effect of a partial suspension on the dates given and act accordingly.

Quickly following the above came the issue of the circular of prices by the Pennsylvania Coal Company, fairly inaugurating the spring season, as follows:

NEW YORK, March 19, 1881.

Present prices for fresh-mined Pittston Coal for immediate delivery at company's Coal docks, Newburgh, subject to the usual conditions of sale and shipment. The company reserve the right to advance upon these prices at any time, except upon orders entered prior to such advance, and orders sent in will not bind the company until accepted:

	Per ton.		Per ton.
Lump	$3.95	Stove	$4.05
Steamer	3.95	Chestnut	3.90
Grate	3.85	Pea	2.90
Egg	3.90		

Fifty cents per ton additional for delivery at New York. The above prices are for cash, city funds.

GEORGE A. HOYT, President.

With the above for a starting point, other companies promptly fell into line—the Delaware and Hudson Canal Company as follows:

The following will be the net prices for our "Lackawanna" Coal, subject to the terms of our printed conditions of sale, delivered free on board at Rondout, for all points on North River and North, excepting the city and harbor of New York. The company reserves to itself the right to change the same at any time, except on contracts made prior to such variation.

	At Weehawken.	At Rondout.
Furnace Lump	$3.90	$3.75
Steamer "	3.90	3.75
Grate	3.90	3.75
Egg	4.05	3.90
Stove	4.20	4.05
Chestnut	4.00	3.85

R. G. MOULTON, General Sales Agent.

The Delaware and Hudson Canal Company will be opened for business on April 1. The company have 337,573 tons of Coal stored at Honesdale awaiting the opening of navigation. Simultaneously comes the Delaware, Lackawanna and Western Railroad Company:

The following will be the prices of Scranton Coal delivered on board vessels at Hoboken, for April shipment:

Lump	$3.90	Stove	$4.20
Steamboat	3.90	Chestnut	3.90
Grate	3.90	Pea	3.15
Egg	4.05		

The company reserves the right to change the above prices at any time except on orders previously accepted. E. R. HOLDEN, Gen'l Sales Agent.

The Lehigh Valley Company issue no circular, but adopt current prices. Lehigh is quoted: Lump, $5; Grate and Egg, $4.35; Stove, $4.25; Chestnut, $4. It is remarked that as the best Coals were before bringing pretty full prices, the new scale really makes little change.

As yet dullness prevails, though the demand is somewhat better, which may be ascribed either to new prices or to the opening of navigation. Bituminous Coals are unsettled. The total amount of bituminous mixed for the year is 770,140 tons, against 676,561 tons for the corresponding period last year—an increase of 93,579 tons. The total tonnage of all kinds of Coal for the week is 669,437 tons, against 364,670 tons in corresponding week last year—an increase of 304,767 tons; and the total tonnage for the Coal year is 5,647,686 tons, against 4,389,636 tons to same date last year—an increase of 1,258,050 tons. We quote water freights as follows: To Boston, $1.15 @ $1.20; to Providence, 80¢; Portland, $1 and discharged; New Haven and Bridgeport, 50¢ @ 55¢; by the Delaware and Raritan Canal from Philadelphia, 61¢.

OLD METALS, PAPER STOCK, &c.

The purchasing prices offered by dealers are as follows:

Copper, heavy	℔	lb.	$0.16 @	$0.17
Copper Bottoms	"	"	.14 @	.14½
Yellow Metal	"	"	.09 @	.09½
Brass, heavy	"	"	.11 @	.12
Brass, light	"	"	.09 @	.09½
Composition, heavy	"	"	.13½ @	.14½
Lead, heavy	"	"	.04 @	.....
Tea Lead	"	"	.03¾ @	.....
Zinc	"	"	.03¾ @	.03⅞
Pewter, No. 1	"	"	.14 @	.14½
Pewter, No. 2	"	"	.08 @	.09
Wrought Iron	℔	ton	24.00 @	25.00
Light do	"	"	11.00 @	12.00
Stove Plate	"	"	13.00 @	14.00
Machinery do	"	"	16.00 @	17.00
Grate Bars	"	"	8.00 @	8.50

The prices current for Rags, &c., are as follows:

Canvas, Linen	℔	lb.	3½c. @ 4 c.
White Cotton, New	"	"	2½c. @ .....
" " No. 2	"	"	2½c. @ .....
White, No. 1	"	"	4¼c @ 4½c.
" No. 2	"	"	2¾c. @ 2¾c.
Seconds	"	"	1 c. @ 1¼c.
Soft Woolens	"	"	10c. @ 11c.
Mixed Rags	"	"	2c. @ 2½c.
Gunny Bagging	"	"	1¾c. @ .....
Jute Butts	"	"	2c. @ 2¼c.
Kentucky Bagging	"	"	3c. @ .....
Book Stock	"	"	2½c. @ 2¾c.
Newspapers	"	"	1½c @ 1¾c.
Waste Paper and Scraps	"	"	½c. @ ¾c.
Kentucky Bale Rope	"	"	4c. @ .....

PHILADELPHIA.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, March 22, 1881.

Pig Iron.—Since date of our last report there has been a steady demand at unchangd prices, and holders of the best brands are, if anything, a shade firmer in their views. The heavy production, however, prevents anything like scarcity, and although the favorite makes of both Foundry and Mill Irons are sold close up, other descriptions are on the market in sufficient quantity and on terms discouraging to those desirous of establishing any general advance. The strength of the market is very remarkable, however, and is indisputable evidence of general business activity. Speculation appears to be dead, absolutely dead, yet the enormous production is absorbed week by week at steady prices, and, so far as can be seen, without sign of accumulation at any point along the line from furnace to cupola. This, too, in face of the most discouraging foreign advices, and of actual purchases of upward of 100,000 tons of foreign Pig metal for American consumption within the past three months. So long as consumption can be maintained as at present, prices are probably safe, but a very slight change in the proportions of supply and demand would have a demoralizing effect. Crop prospects may have a material influence upon prices within the next two or three months. In point of fact, it is not unlikely that the exact measure of prosperity in the iron trade during the balance of the year will be decided by the outcome of the grain and cotton crops. Falling off in the earnings of the transportation companies, actual or prospective, will make a good deal of difference to the largest consumers of Iron. Considerations of this character lead to a very conservative feeling, and the trade generally are, therefore, moving with great caution. The transactions of the week, however, as we have said, indicate a favorable condition of affairs. Good Iron is scarce, and commands high prices compared with other descriptions. One prominent company has made an advance of $1 per ton on their Gray Forge, the demand being more than they could meet with their present output. Should the demand at the advanced price warrant it, another furnace will be blown in at an early date. Sales during the week have not been specially important as regards quantity, but quite sufficient to keep prices steady. The best brands of No. 1 Foundry are quoted $25.50 @ $26.50 (the latter an exceptional figure), with the great weight of business at $25 @ $25.50; No. 2 Foundry is quiet at $22 @ $23; Gray Forge very active for the best brands, which readily command $22.50, others, of less established character, quiet but steady, at from $20.50 @ $21.50.

Charcoal Pig.—The condition of the market is unchanged. Ordinary brands of Warm-blast are offered at $30 to $32.50 and upward. Cold-blast from $35 to $40, according to the character of brand. The best makes are placed with less difficulty than the others, even at the extreme difference in prices.

Foreign Pig.—English Iron is quiet at $18 @ $19.50. For No. 1, 2 and 3 English a bid, equal to about $18.25, was made to-day for a lot of upward of 1000 tons, which is likely to be accepted. Scotch Iron is quiet at $22 @ $22.50 for Eglinton, and $24 @ $24.50 for Gartsherrie. Business in these grades has been limited to retail lots, and bids at lower prices would probably be accepted for round lots for shipment. Bessemer is steadier. Sales of lots in store have been made at about $25, which price is offered for lots of 5000 tons and upward for shipment. About $26 appears to be what sellers are asking for the best brands, but negotiations are in progress, and mutual concessions will probably be made in order to induce business.

Muck Bars.—The demand is fair, but prices are irregular, say $37.50 @ $38.55 at mill. Several sales are reported at figures within the above limits.

Blooms.—There is a good demand, and sellers have placed about all they could offer at last week's quotations, viz., $65 per ton of 2464 lbs. for Charcoal; $55 for Anthracite, and $47.50 @ $50 for Scrap Blooms.

Structural Iron.—There is no change in this department, and business is dull at rates previously quoted. As we said a week or two ago, the general demand is good, but the capacity of the leading mills has been increased to such an extent that, with only an ordinary consumption, it is impossible for manufacturers to keep fully employed. The absence of such a demand as was experienced during the construction of the elevated railways, makes a great difference, and in order to obtain a share of such orders as are on the market, prices for large lots are cut very low, although 2.6¢ for Angles, 3¢ for Tees, and 3.25¢ for Beams and Channels are the nominal quotations.

Bar Iron.—Business is said to be fairly active, although the hoped-for and often-predicted improvement, has not been realized in any marked degree as yet. The bad condition of the roads, and the expected early opening of navigation, may have had some influence on the market. Buyers find it difficult to move heavy loads in country places, and as freights will be lower in a week or two, there is a disposition to postpone purchasing until goods can be moved at lowest rates. Still, while there is no positive dullness, prices have lost something of firmness, and we hear of occasional orders having been taken at concessions which would hardly have been made a week or two ago. This, however, may be only temporary, and if the demand improves as expected better prices will follow very quickly. In the meantime 2.35¢ @ 2.4¢ is quoted at mill, and 2.5¢ from store.

Plate and Tank Iron.—A fair amount of business has been done during the week, and several of the leading mills are pretty well filled up with work until about May. A good many orders have been entered within the past 10 days for ship and bridge work, at prices ranging from 2.65¢ to 2.8¢, at which the market is steady. Some parties ask higher prices, but desirable orders could be placed without difficulty at 2¾¢ for Tank Iron, 3¼¢ for Refined, 3½¢ for Shell, 4¼¢ for Flange and 5¼¢ for Fire-Box.

Sheet Iron.—There is no change in this department; manufacturers have their full capacity employed on orders which will require many weeks to complete. Orders for early delivery are taken at former quotations for small lots, say

Common Sheet, No. 26 to 28	4¼¢
Common Sheet, No. 22 to 25	4 ¢
Common Sheet, No. 16 to 21	3¾¢

Best Refined ¼¢ @ ½¢ advance on the above.

Best Bloom Sheets, No. 26 to 28	6¾¢
Best Bloom Sheets, No. 22 to 25	6½¢
Best Bloom Sheets, No. 16 to 21	6¼¢
Common Red Plates, 3-16 to 16	3.2¢
Blue Annealed, 3-16 to 16	3.4¢
Best Bloom Galvanized, discount	35 %
Second quality, discount	45 %

Steel Rails.—It is impossible to give any but general quotations, for reasons mentioned in previous articles. Manufacturers are full to repletion, but occasionally find opportunity to fill an order for a few hundred or a thousand tons, in which case prices are generally confidential. Probably $62.50 @ $64 covers the extreme limits at Eastern mills, although considerably lower figures are quoted when deliveries are at sellers' option. The object aimed at is to meet prices of foreign Rails, although in the meantime the demand is so large that it is impossible to accommodate all parties. Foreign Rails have, therefore, been sold in considerable quantities, chiefly for the West, South and Southwest at prices varying from $61 @ $65, according to date and port for delivery.

Steel Blooms.—The demand is very active, and several contracts have been closed within the week, chiefly for Pennsylvania mills west of the Alleghenies. Prices have varied from £6. 10/ to £6. 15/, c. i. f.—say, $46 @ $47, at tide, duty paid.

Spiegeleisen.—Several thousand tons have changed hands at about $30 for 10 % manganese, and $37 for 20 %. Market steady.

Iron Rails.—The market is steady, and additional inquiries have been made for good-sized lots. Manufacturers find it difficult to meet competition with foreign Rails, however, especially with the rates of freight demanded for transportation. Foreign Rails are said to be taken through from the seaboard at much lower rates than are accepted for a shorter distance from mills, and several orders have been lost recently, owing to this kind of discrimination. The opening of lake navigation will probably interfere somewhat with orders from the Northwest, as freights *via* the St. Lawrence and lakes are likely to be very low. Manufacturers are fairly supplied with orders, however, and there is a prospect of a good deal of business coming in from roads not likely to use any but American Rails. Heavy sections are held at $47 @ $48, with buyers at about $1 less. Light sections sell at $49 @ $52, according to pattern.

Railway Supplies.—Prices are easier and under sharp competition; Spikes are offered at 2.6¢, Fish Plates at 2.4¢, Bolts and Nuts at 2.25¢ @ 2.75¢.

Old Rails.—The demand has not improved, and under free offerings prices are a shade lower. Sales have been made at from $27.50 @ $27.75 in store, and $27.50 for shipment, but buyers appear to have supplied their early requirements, and are not in the market unless additional inducements are offered to them. A mixed lot of 800 tons sold at $28 on cars, and Doubles at $29. We hear of lots offered now at the above rates, but there is very little disposition to buy, and even at $27, it is not likely that many could be placed.

Crop Ends—Are offered at $29, without finding buyers.

Scrap Iron.—Prices are easier, say $28 @ $30 for Wrought; $19 @ $20.50 for Cast; and $16.50 @ $17 for Stove Plate. Sales are slow, and have been chiefly at medium rates.

PITTSBURGH.

Office of *The Iron Age*, 77 Fourth Avenue, PITTSBURGH, PA., March 22, 1881.

Old winter is still holding on, notwithstanding the first of April is near at hand, and general business is not what it should and otherwise would be in consequence. In the Northwest, snow storms and hard freezing are again in order; railroads are blocked, and goods in transit are delayed at St. Louis, Chicago and other points; this being the case, it is not strange that orders are now held back.

Pig Iron.—There has been no material change in the position of the market during the past week. The demand, as a rule, continues to be of a hand-to-mouth character; consumers, generally, are drawing upon their stocks, instead of anticipating future wants, which may be attributed to the very unsatisfactory condition of the market for Manufactured Iron. However, notwithstanding the lull which has prevailed now for seven weeks in succession, there is no evidence of weakness on the part of producers, who, as a rule, are not disposed to contract for future delivery, and the offerings, especially of desirable qualities, continue light. Furnacemen appear to have great confidence in the immediate future; they argue that as consumers are rapidly depleting their stocks they will be obliged to enter the market before long and, with an increased demand, they claim that another advance may be established. While it is admitted on all sides that the production is large and increasing, as all the furnaces available are in blast, not only in this section, but throughout the West, the consumption is also large and increasing; hence there is no accumulation and not likely to be soon. Prices remain as last quoted. Forge Irons, $21 @ $22, 4 mos., for Cold-short; $22 50 @ $23 for ordinary, and $23.50 @ $24 for extra Neutral; $25 @ $25.50 for Red-short cinder mixture, and $27 @ $28 for all ore do. Foundry grades, $23 @ $23 50, 4 mos., for No. 2, and $25 @ 25.50 for No. 1; Cold-blast Charcoal, $37 @ $39.

Bessemer Iron.—There have been no recent sales except of small, unimportant lots, and we quote at $28 @ $29, 4 mos. There appears to be, so far as we can learn, but little offering, as most of those furnaces working on Bessemer are sold ahead; and as Bessemer Ores continue to rule high, there appears to be but little apprehension on the part of producers of any immediate decline.

Ores.—Late and reliable advices from the Lake Superior districts report that while first-class Bessemer Ores are firm, those grades bought for ordinary mill and foundry use are not as strong as they were a month or more ago. As stated in a former report, the feeling prevails in Iron circles here that the future prosperity of the Iron interests of Pittsburgh depends upon the opening up of new Ore fields nearer home, and that this will be done within the next year or two there is no reason to doubt. Indeed, steps have already been taken with this end in view; and as the trade fully realize the situation, it is confidently believed that the means necessary to bring about the end desired will be forthcoming at the proper time.

Manufactured Iron.—The market continues in an unsettled and unsatisfactory condition, but it is hoped and believed that an improvement, both as regards demand and prices, is near at hand. Bars may be fairly quoted at $2.15 @ $2.25 rates, 60 days with usual discount of 2 % for cash; $2.15 may be regarded as the very bottom. We are reliably informed that efforts have quite recently been made, not only here, but in the Mahoning and Shenango valleys, on the part of buyers to do better, but without success. Some manufacturers are refusing to sell under $2.25 rates, and taking present cost of the raw article into consideration, the margin for profit at the rates in question would be by no means extravagant. Sheet remains unchanged, on a basis of $3.50 @ $3.60 for No. 24; Tank Iron is firmer, but unchanged, at $2.60 @ $2.70; Skelp is still quotable at $2.25 @ $2.35; and Hoop, at $3 @ $3.10.

Nails.—There is but little doing, owing to the backwardness of the season, but as soon as the bad weather is over, so that out-door work can be resumed, an active market is looked for. As most of the Nails in the hands of speculators have been picked up and gone into the hands of jobbers, there is a firmer feeling, and manufacturers, generally, are refusing to make any concessions from full card rates, $3, 60 days, with an abatement of 10¢ ℔ keg on carload lots, and 2 % per cent. off for cash. Large shipments have been made from Wheeling to St. Louis recently, by river, and the supply at the former point is very much reduced.

Wrought Iron Pipe.—At a meeting of the pipe makers the latter part of last week, the discount was reduced from 67½ to 65 %, which is an advance, and it is predicted that there will be an active spring and summer trade. Some change has been made in the card for Boiler Tubes, and the discount was changed from 40 to 45 %. Oil Well Casing, 65¢ ℔ foot, net; ditto Tubing, 20¢.

Railway Supplies.—No recent sales of Steel Rails reported here. Railway Spikes firm, with an active demand, at 2¾¢, 30 days; an order refused the other day at 2.70¢. Splice Bars quoted at 2.25¢ @ 2.35¢, and Track Bolts, 3.25¢ @ 3.30¢ with square, and 3.50¢ @ 3.60¢ with hexagon nuts.

Steel.—While the demand for Merchant Steel, like that for almost everything else, is restricted somewhat by the backwardness of the season, the mills, as a rule, are pretty well employed, and prices have undergone no recent change.

Scrap.—There is a fair business, but no change in prices. No. 1 Wrought, $31 @ $32 per net ton for Selected Railroad, and $28 @ $29 for Ordinary. Old Railway Car Axles, $36 @ $38; Old Car Springs, $40 @ $42; Locomotive Tires, $34 @ $35; Axle Turnings, $20 @ $22; Old Car Wheels, nominal, at $30 @ $32, gross.

Coke.—The activity noted for some time past still continues, and but for the continued scarcity of cars, shipments in all directions would be larger than they are. Prices firm, but unchanged—$1.65 @ $1.75 per ton for immediate delivery, free on cars at ovens.

Window Glass.—While business continues light, owing to the backwardness of the season, manufacturers are refusing to sell, except to supply immediate wants of regular customers at current rates, which we are reliably informed do not more than cover actual cost of production. Following are the ruling discounts: Carload lots, 70 and 5 % on single, and 75 and 5 % on double strength. In a jobbing way—single, 60 and 20 %, and double, 70 and 10 %.

CHICAGO.

Office of *The Iron Age*, 36 and 38 Clark Street, cor. Lake Street, CHICAGO, March 21, 1881.

Pig Iron.—After a brief interval of open traffic during the past week, this section of the country is again blockaded, so far as railroad transportation is concerned. On Saturday we were visited by a severe and entirely unlooked for snow storm, preventing nearly all roads centering here from running, and interfering with all branches of trade generally. While the amount of business transacted here this winter has been to a certain extent satisfactory, the total has, no doubt, fallen short of what would have been done had not the continued snow blockades interfered. The demand for Lake Superior Charcoal Iron continues good, with a fair number of inquiries, but it is impossible to fill orders promptly for the reasons already stated, and transactions have been confined to small orders. The market for Foundry Iron is strong and the demand good, with light supply. We quote: Lake Superior Charcoal Nos. 1 and 2, $32; No. 3, $33; Nos. 4, 5 and 6, $34; Scotch Imported (according to brand), $27.50 @ $29; Scotch American (according to brand), $27 @ 29; Anthracite, $24 @ $26; Coke, $25 @ $27; Silvery (soft), $24 @ $26.

Rails.—We have no change to note in the position of Steel Rails, and quote, nominally, $63 @ $64 for present delivery. The market for Iron Rails continues good. We quote, according to specification, $51 @ $55.

Manufactured Iron.—While the demand for Manufactured continues satisfactory and inquiries numerous, the weather has caused considerable annoyance in the matter of transportation. The market remains firm at the following prices: Bar Iron, $2.50 for ordinary orders, and $2.40 for car-load lots; Sheet Iron, from 10 to 14 gauge, at $3.40, and $3.30 for large lots; Tank Iron at $3.40, and $3.30 for large quantities; Hoop Iron, $3.20 @ $3.30.

Nails.—We have no change to note, prices holding firm at $3.20 for ordinary lots, with usual discount of 10¢ off for carload lots and 2 % for cash.

Steel.—The demand for Tool, Machinery and Agricultural Steel continues fair and market firm. We quote: Tool, 12¢; Machinery (open hearth), 6¢; Crucible Machinery, 7¢; Hammer (Cast), 2 inches and under, 9¢; over 2 inches, 10¢; Cast Spring, 7¢; open-hearth Spring, Tire and Sleigh Shoe, 5¢. In large lots these prices would be shaded.

Scrap Iron.—The demand for Scrap Iron is dull, with a downward tendency in prices. We quote: Forge Scrap, $30 @ $32; No. 1 Wrought, $26 @ $27; Heavy Cast, $23 @ $24; Stove Plate, $17 @ $18.

CHATTANOOGA.

Office of *The Iron Age*, Market and 8th Sts., CHATTANOOGA, March 21, 1881.

Business in the Southern section continues tame and uninteresting. Prices are without change in any leading article. The weather for the week was fine at first, and rough and rainy at the end.

Pig Iron.—The Pig Metal trade goes on steadily. Higher grades are becoming

more plentiful. We quote: No. 1 Foundry, $25 @ $27; No. 2 Foundry, $23 @ $25; Gray Forge, $20 @ $22; White and Mottled, $18 @ $20; Car Wheel Metal, $38 @ $40.

Miscellaneous Articles.—Old Rails are in fair supply, and not very strong, at $26 @ $28; Wrought Scrap, $20 @ $24; Cast, $15 @ $17; Old Wheels, $28 @ $30.

Ores.—We quote: 50 % Brown Hematite, per ton, $2 @ $2.75; Red Fossil, $2 @ $2.25.

Nails.—Nails are in good demand at $3.25 rates.

Manufactured Iron.—Bar Iron continues dull. Other articles in this list have a good and profitable market. We quote Bar at $2.35, and weak; Railroad Spikes, $3; Track Bolts, $4; Trestle Bolts, $4.50; Fish Plate, $2.50.

Coal.—Lump at $4 @ $4.50 per ton, delivered. Manufacturers supplies, $2 @ $2.50, at mills.

Coke.—Furnace Coke, $3 per ton at furnace; Foundry, 10¢ @ 12¢ per bushel.

Steel and Iron Rails.—There is no change in these articles; American Steel, $62; Foreign, $60 @ $61; Iron, $50 @ $52; small T, $57 @ $60.

Lead.—We quote: Pig Lead, 4½¢ @ 5¢.

Steel.—We quote: Plow Slabs, 3-inch and under, $4.70; Black Diamond, ordinary sizes, 13¢.

BOSTON.

MARCH 19.—There is no improvement in the market for raw Irons, and we are unable to see any influences from which expectations of an advance in prices can be reasonably derived. The tendency of the Iron market on both continents appears to be in buyers' favor. We quote *American Pig Iron* at $25 @ $25.50 for No. 1 X; $22 @ $22.50 for No. 2 X, and $20 @ $21 for Gray Forge. These prices are f. o. b. at the port of shipment. Small spot lots will command $2 ℔ ton higher. *Foreign Pig* continues in moderate demand at unchanged prices. We quote: Langloan, $24.50 @ $25; Glengarnock and Gartsherrie, $23 @ $24; Eglinton and Carnbroe, $22 @ $22.50, and Middleboro', $18.50 @ $19 for No. 3 and $20 for No. 1. *Old Rails* are quiet, but held with considerable firmness at $32 for American, and $27 @ $29 for foreign. Buyers are disposed to anticipate lower prices. We have lately heard a consumer say that he would willingly pay $5 per ton more for American Old Rails than for foreign. He says that the shrinkage on some of the latter has been fully 20 per cent. *Manufactured Iron.*—There is a fair demand for Refined Bars at $2.30 ℔ 100 lbs. *Norway and Swedish* are unchanged at $3.75 for Bars and $4.75 for Shapes. *Nails* are firm but quiet at $3 ℔ keg for 10d. to 60d. *Plate Iron* has shown scarcely any change during the past four months. We quote: $2.95 @ $3 for Common and Tank; $3.15 @ $3.25 for C. No. 1; $3.50 @ $3.62½ for C. H. No. 1 Shell; and $4.62½ @ $4.75 for C. H. No. 1 Flange; and 6¼¢ for Bay State X Flange for fire-boxes, &c. *Copper* has been slow of sale, and the lack of confidence which exists in the minds of some holders is evidenced by the purchase by a Boston buyer of 50,000 lbs. of Lake for April delivery at 19¢. The nominal quotation for spot Copper, however, is still 19¼¢ for large lines of Lake, and for Baltimore 18⅜¢ @ 18¾¢. The Boston store price is 19¾¢ for Lake and 18⅞¢ @ 19¢ for Baltimore. There has been no change in the combination prices of Manufactured Copper. We quote: New Sheathing Copper, 26¢; Braziers', 28¢, and Bolts, 28¢; Bottoms, 31¢; American Yellow Sheathing Metal, 17¢ @ 18¢; Yellow Metal Bolts, 20¢; and English Yellow Metal Sheathing, 14¢, in bond. *Lead* continues quiet, and we quote $4.85 for car-load lots, delivered in Boston. Store lots command 5¢ @ 5¼¢ for Western and 4¾¢ @ 5¢ for Remelted. The prices of manufactures are unchanged, as follows: Bar, 6½¢; Pipe, 6½¢; Sheet, 7¢; Tin-lined Pipe, 15¢; Tin Pipe, 40¢, all less 10 % to the trade. No. 1 Solder, 11½¢. *Spelter* is quiet and unchanged, quoting common Western at $5.20 by the car-load, and 5¼¢ @ 5⅜¢ for smaller lots. Remelted is obtainable at 4¾¢ @ 4⅞¢. *Sheet Zinc* is in moderate demand at 7¢ @ 7¼¢. *Tin* is fairly active and firm, quoting Straits and English at 20¢. The present tendency in this metal is rather upward than downward. *Tin Plates* are dull and in buyers' favor. We quote good-sized lots, ordinary brands, as follows: Charcoal Bright, $6 @ $6.25; ditto Ternes, $5.25 @ $5.37½; Coke Tin, $4.90 @ $5, and ditto Ternes, $4.87½ @ $5.—*Commercial Bulletin.*

CLEVELAND.

MARCH 22.—*Pig Iron.*—The demand for Pig Iron continues about as heretofore noted. Consumers are buying in a small way, and in no case are they anticipating their wants to any material extent. Buyers of Charcoal Pig Iron are taking up considerable of the lots now in store here, and are also buying for next year's delivery. The Bessemer mills and other users of Bessemer grades of Pig Iron have anticipated their wants for three or four months. The result has been a stiffening in Bessemer Pig Iron, which has advanced about $2 a ton within the last 60 days, and is to-day firmly held at $27 @ $28 at the furnace. Ordinary grades of Foundry Iron are weak, with a downward tendency. Mill Irons not of standard quality show no tendency to advance, but are ruling here at from $20 to $22 a ton. Owing to the scarcity of Lake Superior Ore for immediate delivery, all Red-short Irons are firm. Old Rails are exceedingly active at $31 @ $33 a ton.

BESSEMER.		
Bessemer Speculars and Magnetics	$9.50 @	$10.50
Bessemer Hematites	7.50 @	9.50
Menominee Range Ores	8.00 @	9.50
MILL ORES.		
Speculars and Magnetics	8.50 @	10.50
Hematites	7.00 @	8.50

LOUISVILLE.

Messrs. GEO. H. HULL & Co., Commission Merchants, report to us as follows, under date of March 18: The market is firm, and sales are large. There is still a disposition on the part of manufacturers to buy for long delivery ahead. Southern Neutral No. 1 Mill is firm at $22, cash, with No. 1 Foundry at $24. Hanging Rock Charcoal No. 1 Foundry is selling at $27 @ $28, while some brands of No. 2 Foundry are bringing as high as $30.50, because of their great strength and value in special castings. We quote for cash as below:

FOUNDRY IRONS.	
Hanging Rock Charcoal No. 1	$27.00 @ 28.00
" " No. 2	26.00 @ 30.00
No. 1 Southern, Charcoal	24.00 @ 25.00
No. 2 " "	22.00 @ 23.00
No. 1 Hanging Rock, Stonecoal and Coke	23.50 @ 24.00
No. 2 Hanging Rock, Stonecoal and Coke	22.50 @ 23.00
No. 1 Southern, Stonecoal and Coke	23.50 @ 24.00
No. 2 " " "	22.50 @ 23.50
"American Scotch"	23.00 @ 24.00
Silver Gray	19.00 @ 22.00
Scotch	25.00 @ 26.00
MILL IRONS.	
No. 1 Charcoal, Cold-short and Neutral	$22.00 @ 24.00
No. 1 Stonecoal and Coke, Cold-short and Neutral	22.00 @ .....
No. 2 Stonecoal and Coke, Cold-short and Neutral	21.00 @ 21.50
No. 1 Missouri and Indiana Red-short	26.00 @ 27.00
White and Mottled, Cold-short and Neutral	19.00 @ 20.00
CAR WHEEL AND MALLEABLE IRONS.	
Hanging Rock, Cold-blast	35.00 @ 42.00
Alabama and Georgia, Cold-blast	35.00 @ 40.00
Kentucky, Cold-blast	35.00 @ 40.00

W. B. BELKNAP & Co., Iron and Steel Merchants, Nos. 113 and 115 Main street, report to us as follows, under date of March 19: While there is no quotable change, the market is quieter, sellers rather freer and buyers a little offish. This is not to be wondered at after the remarkable steadiness of the past three or four months. There are plenty of buyers awaiting concessions, however, and there would be no trouble in disposing of mill product at a cut. The abundance of Iron offering is due, it is said, to the general backwardness of the season, particularly in the Northwest. When that section comes into market for its supply we are promised higher prices. However that may be, in some quarters the chances are that between Southern and Northern mills this market will not lack. Nails are just holding their own, though we can learn of no cutting. The building of a bridge across the river just below the Falls, connecting New Albany with this city, is now assured, much to the satisfaction of both sides. The St. Louis Air Line and the Louisville, New Albany and Chicago Railway will use it.

ST. LOUIS.

Messrs. HOFFER, PLUMB & Co., Pig Iron and Iron Ore Merchants, 417 Pine street, write as follows, under date of March 19: The market is quieter, but prices are firm. We quote for cash:

HOT BLAST CHARCOAL.	
Missouri, No. 1	$28.00 @ 29.00
Southern, No. 1	26.00 @ 28.00
Ohio	29.00 @ .....
COKE AND COAL.	
Missouri No. 1	none offering.
Southern No. 1	25.00 @ 26.00
Ohio No. 1	24.00 @ 26.00
MILL IRONS.	
Cold-short	22.50 @ 23.00
Red-short	26.00 @ ...
CAR WHEEL AND MALLEABLE IRON.	
Missouri	32.00 @ 35.00
Southern	35.00 @ 38.00
Ohio	35.00 @ 43.00

R. L. COLEMAN & BRO., Fourth and Pine streets, write us as follows March 21: Our market remains quiet, with no changes worthy of remark. The demand is fair and prices unchanged, but probably slight concessions could be obtained for large purchases. We quote for cash, f. o. b. here:

FOUNDRY IRONS.	
No. 1 Hanging Rock, Charcoal	$27.00 @ 28.00
No. 2 " "	26.00 @ 30.00
" Coke and Stonecoal No. 1	24.00 @ 25.00
Hanging Rock Coke and Stonecoal No. 2	25.00 @ 25.00
Southern Charcoal and Coke No. 1	25.50 @ 27.00
Missouri " " No. 1	26.00 @ 27.00
Silver Gray	22.50 @ 23.00
MILL IRONS.	
No. 1 Cold-Short and Neutral	22.50 @ 23.50
No. 1 Red-Short	25.00 @ 26.00
CAR WHEEL AND MALLEABLE IRONS.	
Hanging Rock Cold Blast	42.00 @ 44.00
" Warm Blast	35.00 @ 38.00
Lake Superior	35.00 @ 38.00
Southern	35.00 @ 40.00

RICHMOND.

Mr. ASA SNYDER, Iron Merchant and Furnace Agent, writes as follows under date of March 21: The tone of the market continues firm. Transactions for the week in Scotch Irons have been small. American makes are in good demand. Old Rails are stronger and inquiries numerous. Sales show no change in prices since last report:

Scotch Pig Iron	$24.00 @ 27.00
American Scotch Pig Iron	27.00 @ 29.00
No. 1	25.00 @ 28.00
No. 2	22.00 @ 25.00
No. 3	21.00 @ 23.00
Mottled and White	19.00 @ 21.00
Virginia Charcoal C. B. Wheel Iron	38.00 @ 41.00
Old Rails	26.00 @ 28.00
Old Wheels	28.00 @ 29.00
Wrought Scrap, No. 1	22.00 @ 25.00
Cast Machinery Scrap	21.00 @ 22.00
Richmond Refined Bar Iron	@ 2.6
Horse Shoes, Tredegar	@ 4.00
Mule " "	@ 5.00

CINCINNATI.

MARCH 21.—*Pig Iron.*—The market has been fairly active during the past week. The outputs are about equal to the production of the districts from which this market draws supply. Best grades of Hanging Rock C. C. Iron are held firmly at top quotations, while some good and fair Nos. 1 and 2 can be had freely at bottom figures. Coke Irons are taken promptly for immediate use at about quotations. At the present there is being an accumulation of Silver Gray and lower grades of raw Bituminous Irons, which will all be taken in round lots a little later in the season. Sales during the past week justify the following quotations:

	4 months.
Best No. 1 C. C.	$27.00 @ 27.50
Good No. 1 C. C.	26.00 @ 27.00
" No. 2 "	25.00 @ 26.00
Best Coke	25.00 @ 25.50
Good "	24.50 @ 25.00
No. 2 "	23.00 @ 23.50
Best S. G. Bituminous Coal	22.00 @ .....
Good " "	21.50 @ .....
No. 2 " "	21.00 @ .....
Close & strong " "	21.00 @ 22.00

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(*From our Regular Correspondent.*)

LONDON, ENG., March 7, 1881.

NO IMPROVEMENT

can be placed on record as having taken effect since I last wrote in the general condition of the iron trade and its allied industries, all the facts, indeed, bearing in the other direction. It is abundantly evident, on all hands, that the market here is again greatly depressed, and that prospects are uninvitingly dull so far as they touch the near future. It would seem that the unusually long winter, with its exceedingly frequent snow storms, gales and heavy rains, has had the effect of strangling the activity which was so generally observable at the beginning of the year, and that these hindrances to the development of the demand have had their effects intensified and multiplied by the continuance of a production at a rate wholly unprecedented in the entire history of our leading metallurgical commerce. These reasons have, it is clear, operated in a sort of "square" manner, their forces having reacted upon each other in the most unfavorable way. As regards the weather, it must be admitted that we have had no such winter for length and strength for a long series of years. London and the South of England have not so much room for complaint as the Midlands and North—including Scotland, where the gales and snow storms have lately been of almost weekly occurrence and unprecedented severity. Within the past fortnight, for instance, there have been three or four distinct falls of snow throughout most of the country north of, say, Leicester, and at the time of this writing, telegrams are arriving announcing that snow has fallen in Scotland for 50 successive hours, all the railways being blocked and many passenger trains buried or otherwise blockaded. With a continuance or even rapid alternation of such weather, it is plain that outdoor occupations must suffer seriously, and that a proportionate lack of activity will be felt by the industries supplying the materials for such pursuits. The builders, for instance, cannot get on during frosts, and their enforced idleness reacts upon the iron founders, brass founders, hardware men and others. Bad weather also narrows the sphere of business activity generally, seeing that the public, especially ladies, will not undertake other than urgent shopping missions. The introduction of goods for the spring season is for the same reason delayed; hence the weather on this occasion may reasonably be said to have a good deal to answer for. Looking at the question in its remaining aspect, I cannot do more than reiterate all that I have recently had occasion to remark on the subject of overproduction. So long as there is no organized attempt to balance the production with the demand, so long (and no longer) will the existing stagnation continue unrelieved. We cannot force the world, whether within or outside our own borders, to use our iron, so that if we will make one-third more than we can sell, we must expect a severe struggle to secure buyers and a corresponding cutting of prices. Everything demonstrates the unwisdom of the present policy, but nothing shows that the ironmasters are prepared to save themselves and the trade of which they are prime factors from utter disorganization and partial ruin. It is better, we are told, to keep going at a small loss rather than stop altogether, and it is urged that what is true of the individual firms also holds good in respect of the aggregate. This may be so; I don't say it is not the case, but I have grave doubts as to the wisdom and success of the policy, especially with the present outcome of its embodiment before my view. Scotland, for instance, may be said to have a virtual monopoly of the class of iron it supplies. Why, then, should not the ironmasters of that country arrange their business so as to make prices yield them a living profit, instead of existing on mere sufferance as they do? Cleveland is not quite so independent, but it has a grip of the market in other respects which is strong enough to enable it to take some liberties with the rate of production. At present, both localities have such an enormous quantity of iron in reserve that the actual producers are the mere slaves of outside influences, which they cannot control under the present system, and which make them work on a basis which they do not determine and cannot revise. Were they to lay down a rule that when the reserve stocks exceed a specified tonnage, then a fixed number of furnaces should be stopped, or else make selling prices a factor in the regulation, they would keep the matter more in their own hands, and to a great extent remain controllers of their own affairs. Large stocks are, on many grounds, undesirable and unnecessary. When Great Britain was the sole iron-making country, there was a certain possibility of big rushes setting in now and then, on which occasions large stocks could be—and, as a matter of historical fact, were—utilized. Now that the United States, Germany, France, Belgium, Austria, &c., are largely self-supplying, the accumulation of such gigantic stocks is not even politic, seeing that there is no probability of an iron famine in any direction, and no chance whatever of a combined rush upon our resources, save only in the event of another war between Germany and France—two of our competitors, but not two of our best customers for the majority of our manufactures. It is, consequently, perfectly useless and feeble to rake up old precedents in justification of this piling up of stocks, for these ancient and well-worn platitudes have had their day and may now be decently buried. I do not think, nevertheless, that mere arguments will influence the producers in this matter, but I am of opinion that the sterner logic of facts will shortly settle things by cutting the knot in a manner which will let out the financial "sawdust" which is serving for solid substance in the case of two or three concerns. There was something approaching to a scare last week at Glasgow, but the difficulty was smoothed over, and the iron and coal company concerned is going on as heretofore. I do not wish it to be inferred that the Scotch iron trade is rotten as a whole, but the bare facts as you have them are ample to show that at current prices and with the depression at home and in respect of shipments, there must be concerns which cannot withstand the pressure of the times. Leaving this subject for the time being, let me briefly record a few of the facts and figures of the past week, during which (as I have already stated) business has been very dull in almost every department. Pig iron has receded about 1/ a ton on Scotch, Cleveland and ordinary kinds, while hematites are 2/6 to 5/ weaker, owing, it is said, to forced realizations by second holders. Manufactured iron, so far as it relates to ship plates, angles and other heavy articles, has been steady, with a fair production at the works, but ordinary merchant iron is very dull and excessively slow of sale. Welsh bars are offered at £5. 2/6 to £5. 5/, and common Staffordshire, Lancashire, Yorkshire, &c., at £5. 15/ to £7. Marked Staffordshire bars of "list" qualites are still £7. 10/, but underselling is general, and it is not unlikely that quotations may be officially lowered to £7 within the next few weeks. Hoops are being ordered on United States account, but not in very large lots. Iron rails are steady at late rates, and steel rails strong at £6. 5/ to £6. 15/, with a good inquiry from your buyers and from Mexico, Australia, &c. Bessemer blooms are still sought after, but are scarce and held at £6 or thereabouts. For old rails the demand is fair and for scrap of good quality moderate, at rates which your weekly cablegram will have made known to your readers.

SCOTCH PIG IRON

is very dull and lifeless, and is wholly without features to note. Both warrants and makers' brands are at a lower level than for nearly a year past, and the statistical position is such that a further drop is more probable than anything else, especially with the extremely bad weather which has prevailed during the past few days. It is, further, beginning to be admitted that it is entirely futile to build up hopes on the chance of a renewal of your demand, all advices from the United States being unanimous in estimating the likelihood of new business with you in Scotch pig iron as being meager. The ironmasters, however, seem to think the opening of the shipping season may administer a fillip to their prospects; indeed, any excuse appears better than none in support of the continuance of the present output. One furnace only (at the Almond Iron Works, near Falkirk) has been damped down, and that was going on hematites. There remain 120 furnaces at work, including 7 on hematites, against 113 a year ago. Stocks in Connal's stores are 528,067 tons, against 443,883 tons this date, 1880. Shipments to date show a total decrease of 34,074 tons, and importations into Scotland of Middlesboro' iron of 9740 tons. Ballast pig is 43/ alongside. Writing from Glasgow, March 5, James Watson & Co. said: "During the past week the market has been very depressed, owing to the limited demand for makers' iron, and consequent disappointment on the part of holders who have been freely selling warrants. On Monday the price declined from 50/ to 49/6½ per ton, a large business being transacted, and on Tuesday the market was quiet, with transactions from 49/5 to 49/7, cash. On Wednesday a pressure of sales caused price to recede from 49/6 to 48/11 per ton, while yesterday the market was irregular; opening at 48/10½, it declined to 48/9, afterward improving to 49/3, cash. To-day the feeling was dull, with business from 48/9 to 48/7, cash, closing buyers at 48/8, sellers 48/9 per ton. The shipments last week were 11,266 tons, as compared with 12,603 tons for the corresponding week of 1880." We quote:

	No. 1.	No. 3.
G. M. B., at Glasgow	50/6	48/6
Gartsherrie, at Glasgow	59/	51/
Coltness, "	39/6	51/6
Summerlee, "	58/6	50/6
Langloan, "	59/6	51/
Carnbroe, "	56/6	50/6
Calder, "	59/	50/6
Glengarnock, at Ardrossan	50/6	51/6
Eglinton, "	51/	48/6
Dalmellington, "	51/	48/6
Shotts, at Leith	59/6	52/6
Kinneil, at Bo'ness	51/6	49/6
Carron, at Grangemouth	51/6	51/

CLEVELAND PIG IRON

is quiet and without buoyancy, at the following figures for G. M. B., net cash, at makers' wharves in Tees:

No. 1 Foundry	42/6	Mottled	37/
2 "	40/6	White	36/6
3 "	38/6	Refined Metal	55/
4 "	38/	Kentledge	41/
4 Forge	37/6		

The returns of the Cleveland Ironmasters' Association for the month of February show the following particulars: Total make of Cleveland pig, 161,832 tons—a decrease of 15,112 tons; make of other pigs (hematites, &c.) 44,119, a decrease of 3777 tons; foreign shipments from Middlesboro, 19,309—decrease, 19,297 tons; coastwise shipments of pig from Middlesboro, 39,061—increase of 6094 tons; makers' stocks Feb. 28, 159,904 tons—increase, 11,235 tons; in public stores Feb. 28, 170,783 tons—increase, 12,946 tons; in makers' stores, 70,631 tons—decrease, 2428 tons. There is shown a net increase of 21,753 tons in the stocks during February, a circumstance which is not favorable to an early increase in selling prices. There are 120 furnaces now at work in Cleveland.

THE DARLINGTON IRON COMPANY

have suspended payment, after a long struggle against adverse elements and impracticable finance. The capital of the company was £350,000 in £20 shares, with £18. 10/ each paid up. The shares a few days ago were quoted at 15 per cent. discount; now, of course, they are almost difficult to get rid of at any price. The shareholders received circulars on Friday stating that in consequence of the non-success of an attempted issue of £75,000 worth of 6 per cent. debentures, the directors had felt it advisable to suspend payment. Meetings of the creditors, as well as of the shareholders, will be held, a provisional arrangement being made meantime to carry on the business. The company date their decline from the period when the making of iron rails practically ceased in the North of England.

DEPHOSPHORIZATION

at Eston is pronounced a success, and (as I informed you several weeks ago) two additional 15-ton converters are to be put down in order to augment the output, which will shortly reach 3500 tons weekly. These facts, with others relating to "ways and means," appear in Bolckow, Vaughan & Co.'s annual report.

WEST COAST HEMATITES

are 2/6 @ 7/6 per ton cheaper, owing to the desire of second holders to realize and the adverse tone of the markets generally. It is not likely that the weakness will prove lasting in this department, particularly if the rail trade maintains its activity. Current rates for small or average parcels are:

	No. 1.	No. 2.	No. 3.
Cleator	72/6	70/	67/6
Lonsdale	64/	63/	62/
Workington	64/	63/	62/
Lowther	64/	63/	62/
Moss Bay	64/	63/	62/
Harrington	64/	63/	62/
Solway	64/	63/	62/
Maryport	...	...	62/
Askham	64/	63/	62/

AT SHEFFIELD

matters are quiet, especially in some of the higher departments, in which there has been a distinct relapse during the past few weeks. The Bessemer and other steel works are busy, relatively speaking, and the former are really doing a heavy turnover, albeit I am assured the resultant profits are largely problematical. The strike of the miners in South Yorkshire and Derbyshire is assuming awkward proportions, and is likely to prove inconvenient to the Sheffield manufacturers in the heavy trades. The gentlemen who tried to elevate Messrs. Staniforth's sickle grinding works to heaven by means of gunpowder are still at large, despite the abnormal activity of the police and a reward of £105. The trade union asserts its innocence. This is good. It looks well, and is always regarded as a necessary consequence to any outrage. Bessemer blooms, &c., are about 2/6 cheaper at some of the Sheffield works.

A TESTIMONIAL FOR AMERICAN STEEL

was given last week by Mr. Henry Seebohm, a gentleman who, besides being a great traveler, a learned ornithologist, antiquarian, &c., &c., is the head of the steel firm of Seebohm & Deickstahl, Sheffield. Mr. Seebohm delivered a capital lecture before the London Cutlers' Company, on "The Use of Steel" (which, by-the-by, is reported verbatim in the *Ironmonger* of March 5), and towards the conclusion said: "* * * * * At length I came to Pittsburgh, the Sheffield of America. Now, thought I to myself, I shall spy out the nakedness of the land. Here, at least, I shall have the satisfaction of knowing that America has something to learn from the old country yet. After dining at the hotel—where, by the way, two of the *entrées* were squirrel and frogs—I inquired of the landlord who was the largest crucible steel manufacturer in Pittsburgh. Writing down the name and address of the firm, I took a tram car, and soon found myself in their office. Giving my card to a clerk, I stated that I was a steel manufacturer from Sheffield, and should take it as a favor if I might be allowed to see over the works. was ushered into the private office. The proprietor rose from his seat, shook me by the hand, and said, 'How do you do Mr. Seebohm? I have known you by name for many years, and am delighted to make your personal acquaintance. I read with great interest a pamphlet you once wrote on the manufacture of steel, and it will give me much pleasure to show you over my works.' I found everything constructed on the latest and most improved system. Many little dodges were explained to me which had for their object the improvement of the quality or the lessening of the cost of the steel, and I was obliged to admit that in the practical part of the manufacture I might have something to learn, but could have nothing to teach. When we returned to the office I had nothing left except to play my trump card. So I began to speak cautiously and tentatively about the analysis of Swedish iron. I had no sooner broached the subject than my host produced his analysis book and showed me the analysis of all the marks he used, and we found, upon exchanging notes, that for many purposes we had each chosen the same marks, guided by chemical analysis alone. I assure you that I returned from America impressed with the idea, which I wish to impress upon you, that if this country intends to hold her own among the manufacturing countries of the world, she must do much more in the matter of technical education than she has yet done, or she will inevitably be left behind in the race for wealth." This warm and generous piece of testimony does Mr. Seebohm credit, and demonstrates the fact that his travels have rendered him more cosmopolitan and open in his views than the majority of his townsmen, who, although splendidly hospitable and undeniably hearty, thorough and genuine, are extremely wary in business matters. I should like to learn the name of one Sheffield crucible steel works where an American steel manufacturer could call, make himself at home, and compare notes as to analyses and working practice. I do not know of one. In the same issue of the *Ironmonger* I notice an able letter from Sir Henry Bessemer, hitting Sheffield very hard indeed.

THE BOARD OF TRADE RETURNS,

for the month of February have been issued to-night, just as I am closing this letter. They show that the value of the imports has been £36,646,270, against £33,246,028 in February last year, and £28,661,080 in 1879. The value of exports for the month was £16,835,550, against £16,504,708 in February last year, and £12,713,069 in 1879. For the two months ending February the imports reached £63,389,232, against £65,618,935 last year, and £55,028,126 in 1879. The exports during the same period amounted to £34,154,461, against £33,417,566 last year, and £26,909,557 in 1879. In iron and steel the falling off has been considerable, counterbalanced, however, by better exports of cotton goods, machinery and other staple manufactures. I will furnish details in my next letter.

TO THE UNITED STATES

from the Bristol Channel ports (Cardiff,

Swansea, Newport, Bristol) alone there went during February: Tin plates, 99,604 boxes; pig iron, 1330 tons; crop ends, 597 tons; blooms, 4067; wire, 2431 bundles; rails, 11,280 tons; sundries, 1200 ingots and 10 barrels of tin, and 180 cases of yellow metal. There were dispatched to Tampico 457 tons rails, and 213 tons spikes, fish plates, &c.; and to Vera Cruz, 690 tons rails. Freights from these ports are stiffer. To Galveston wharf, 23/ by sailing vessels is asked; to New Orleans, 15/ @ 16/6, with 9/ for sailing vessels to Northern ports with pig and rail crop ends. Freights are pretty sure to advance shortly to your side.

FOREIGN.

FRANCE.

(Moniteur des Interets Materiels.)

PARIS, March 6, 1881.—*Metals.*—Since our last report business has been dull and metals have been weak, each showing a slight decline. We quote *Copper*:' Chili Bars, 158.75 @ 161.25 francs the 100 kilos.; Ingots and Slabs, 116.25; Best Selected, 171.25, and pure Corocoro Ore, 162.50. *Tin*—We quote Billiton and English Common, 235, and Banca, Straits and Australian, 237.50. *Lead*, 37.50 @ 38.50, and *Spelter* 42.25 @ 42.50. *Iron.*—There has been no great change during the week; Merchant Iron moves off at 19 francs with some difficulty, and do. for Flooring at 19.50. Sheet Iron is, comparatively speaking, more favorably situated here, and common quality of from 3 millimeters upward is bringing 25 francs. In the Haute-Marne the demand is limited, except for Merchant Iron and Castings. Both Wire and Nails still sell with great ease. The North still receives a good many orders, and is of good cheer, feeling sure, it would seem, that prices for Merchant Iron will be sustained. Car manufacturers have received so many orders that they decline making any further engagements for the moment; all railroads in urgent want of cars, therefore, have to procure them from abroad. Accounts from the Meurthe and Moselle are also reassuring. *Coal.*—As for the Coal market, we may mention that it continues to be rather weak, without any essential change in prices since our last.

BELGIUM.

(Revue Universelle.)

BRUSSELS, March 6, 1881.—*Iron.*—Since our last report the Iron market in Belgium has relapsed into quietude, and the tendency, if anything, has become a downward one. Although the rolling mills are known to be well provided with orders, Pig Iron sympathizes with the drooping attitude, and only the Steel works seem to remain uninfluenced by the less cheerful aspect, obtaining, as they do, full prices for their makes. Meanwhile, the business done for export is still tolerably good, causing the machine shops and boiler works to keep up a steady amount of activity. But for the demand from them, Merchant Iron and Sheets would be considerably lower, probably, than they are. This export business may, therefore, enable us to overcome the slight reaction which has just begun to set in, and carry us into smoother water without too heavy a decline. Much will, of course, depend upon further developments in England and Germany. The immediate future is, therefore, more doubtful than it appeared only a few weeks ago. *Coal.*—The duller feeling in Iron has contributed to weaken the Coal market, the more so since Coal prices were really a little too high. A decline in nearly all sorts seems to be impending, and may revive the demand for Coal for industrial purposes after it is fairly established, and thenceforward greater steadiness may rule.

GERMANY.

(Borsenhalle.)

HAMBURG, March 4, 1881.—*Iron.*—"Since my last report," our Dortmund correspondent states, "there has been no change. Pig Iron remains in good request at satisfactory rates. The orders being filled in this vicinity are heaviest, I believe, in Steel Rails, for even during the past few weeks additional ones have dropped in for government account for Steel Rails and for Iron sleepers; also for the Cologne-Minden line, and other railway material. Then there will be, on the 11th inst., a large adjudication for the Hanover State line. But nothing new is received from abroad. In Merchant Iron and Sheets most of the works will be busy yet for some time, but new orders are received to a limited extent only; it is doubtful, therefore, whether present quotations can be sustained a couple of weeks longer. *Coal.*—The better feeling has not been maintained, fresh orders have got to be scarce and some miners have been dismissed, which seldom takes place before April in normal times. While some steamers navigating the Rhine have been sold to proceed to the Black Sea, others—more suitable ones for our wants—are being built." In the Moselle and Sarre region the Iron requirements have slackened considerably, but the Dilling and Burbach works, as well as the Ars wire drawing concerns, still receive a good run of orders. De Wendel & Co. at Hayange, the Lorraine Iron Works at Ars, and Stunam Brothers at Neunkirchen, will soon adopt the Thomas-Gilchrist dephosphorizing process. Should the same prove a success, a great future will dawn upon the Lorraine Luxembourg Iron branch. Now, already, valuable Iron ore property has passed from the hands of private parties into those of Lorraine and Westphalian Ironmasters. *Metals.*—Sales have been limited to trifles. Lead is in better demand. We quote: English Pig, 17 @ 17.50; ditto Sheet, 17.50 @ 18; German, 15.30 @ 15.50; and Spanish, 18 @ 18.50. Copper is duller. Swedish at 70; Drontheim at 73.50 @ 75; Wallaroo, 73 @ 74; N. A. Slabs, 76 @ 77; and English Refined Ingots, 68 @ 69. Tin lifeless at 95 @ 100. Spelter inactive at 16 marks per 50 kilos., spot and to arrive.

SPAIN.

(Cronica de la Industria.)

MADRID, Feb. 28, 1881.—The government has just published the export statistics for 1880, as compared with the previous year, showing the ensuing metal items, values being reduced to thousands of pesetas or francs.

	1880.		1879.	
	Tons.	Value.	Tons.	Value.
Quicksilver	1,099	6,046	2,100	12,789
Copper	20,995	20,467	20,834	17,240
Iron	26,173	2,757	28,351	2,737
Lead	92,400	45,170	100,336	50,549
Calamine	32,491	1,787	27,613	1,508
Copper Ore	501,425	35,942	459,576	34,908
Iron Ore	2,932,858	29,329	1,064,116	10,641
Other Ores	49,632	7,246	7,246	5,379
Total	3,657,073	148,744	1,748,502	135,751

The decrease in Quicksilver and Lead, and the increase in Calamine and Iron Ore will be noticed. Copper, it will be seen, keeps steady.

HOLLAND.

(Koch & Vliertboom.)

ROTTERDAM, March 5, 1881.—*Tin.*—Since our last report the market has been steadier, at 52.50 guilders per 50 kilos. for Banca, and 52 for Billiton.

AUSTRIA.

(Austrian Trade Journal.)

VIENNA, March 5, 1881.—*Iron.*—The situation in Austria has undergone no perceptible change; the demand for Iron is, on the whole, slack; only comparatively few works are very busy. A plan is on foot to consolidate the Huttenberg, Egydi-Kindberg and Koflach works with the Fridau and Styrian, to bring about which there have been made overtures to the Austrian Savings Bank to facilitate the financial part of the project, which attracts a great deal of attention. Nothing further has transpired in connection with the Tin Plate combination. We quote Pig Iron, 44 @ 64 florins the 100 kilos; Merchant, 115 @ 120 for Corinthian and Austrian, and 100 @ 110 for Moravian, Silesian, Hungarian and Bohemian; Sheets, 155 @ 170. *Metals.*—The dull, depressed feeling here has found no relief; there is neither a consumptive nor a speculative demand, and the dealings are restricted. We quote to-day in florins, per 100 kilos.: Copper, 74 @ 90; Tin, 115.50 @ 116; Antimony, 79; Lead, 21 @ 25; Shot, 26; Litharge, 20.25 @ 20.75; Spelter, 19 @ 20; Sheet Zinc, No. 8-26, 25.25; Gun Metal, 60; Brass, 46 @ 62; 97 ℔ Nickel, 4.75 per kilo; Bismuth, 11.50; Blue Vitriol, 28 @ 29; ditto for telegraphs, 34; White Vitriol, 14; Salzburg Vitriol, 14 @ 17, and Green Vitriol, 4.75 @ 5.25; Minium, 29; Sugar of Lead, 45, and Zinc White, green seal, 44; red ditto, 34, and blue, 33 per 100 kilos.

EAST INDIES.

(Schmidt, Kustermann & Co.)

PENANG, Feb. 1, 1881.—*Tin.*—Since departure of the last mail, an improved demand at first manifested itself for India, leading to some transactions at $27.40 @ $27.50 for India. Prices later on receded to $26.90; but, upon receipt of more encouraging news from Europe and the United States, prices began to recover and finally rose to $28 @ $28.10 per picul. This is also the closing figure. Stock in bazar, 2600 piculs. Arrivals since January 21 have been 5500 piculs, of which 3760 were taken for Europe and America at $26.90 @ $28, and 3000 for China at $26 90 @ $28.10. *Exchange* has been dull all along at 3/8⅛ @ 3/8¼ for 4 months' bank bills.

(Gilfillan, Wood & Co.)

SINGAPORE, Feb. 8, 1881.—*Tin.*—The sales of the fortnight do not amount to 300 tons, and there is a stock of something like 200 tons. The price has ranged from $28.50 to $28.52½ per picul, closing with sellers at $28.25 and no buyers. Shipments from the Straits settlements to the United States in January have been only 2186 piculs, against 23,796 in 1880; 4635 in 1879; 8217 in 1878; 200 in 1877, and 4605 in 1876. *Freights.*—The Escort has cleared for New York, leaving no ship on the berth. The Hettie M. Bangs has been chartered for Boston on secret terms. *Exchange* is weak at 3/9 for 6 months' sight private bills.

Production, Exports and Imports of Gold and Silver.

The gold and silver production by States and Territories is given by the Director of the Mint as follows, for the year ending June 30, 1880:

	Gold.	Silver.	Total.
Alaska	$6,000	.....	$6,000
Arizona	400,000	$2,000,000	2,400,000
California	17,500,000	1,100,000	18,600,000
Colorado	3,200,000	17,000,000	20,000,000
Dakota	3,600,000	70,000	3,670,000
Georgia	120,000	.....	120,000
Idaho	1,980,000	450,000	3,430,000
Montana	2,400,000	2,500,000	4,900,000
Nevada	4,800,000	10,900,000	15,700,000
New Mexico	130,000	425,000	555,000
North Carolina	95,000	.....	95,000
Oregon	1,090,000	15,000	1,105,000
South Carolina	15,000	.....	15,000
Utah	210,000	4,740,000	4,950,000
Virginia	10,000	.....	10,000
Washington	410,000	.....	410,000
Wyoming	20,000	.....	20,000
Other sources	14,000	.....	14,000
Total	$36,000,000	$39,200,000	$75,200,000

The total production, estimated by the Director of the Mint, in his annual report, amounted to about the same as the aggregate of the foregoing details. The imports and exports of precious metals during the last calendar year have been as follows:

GOLD.

Month.	Imports.	Exports.	Net.
January	705,568	226,205	569,363
February	464,473	149,612	314,861
March	822,780	1,106,679	*274,499
April	166,432	89,192	77,240
May	123,589	106,497	17,083
June	658,272	541,361	106,911
July	244,330	61,886	182,444
August	9,131,890	90,909	9,040,981
September	18,846,998	80,914	18,766,084
October	16,256,058	160,871	16,086,187
November	9,555,391	220,759	9,334,532
December	16,506,026	158,574	16,347,452
Total	73,631,198	3,0624.69	70,168,730

SILVER.

Month.	Imports.	Exports.	Net.
January	788,496	1,192,294	*403,798
February	1,085,355	1,120,454	*35,099
March	1,223,252	842,463	380,789
April	975,394	327,191	648,403
May	923,637	1,599,034	*600,377
June	784,583	713,614	70,949
July	800,780	658,773	142,007
August	717,848	520,490	197,358
September	822,895	484,930	337,965
October	1,120,006	2,654,055	*1,534,049
November	1,046,382	1,006,149	40,233
December	1,280,677	1,863,975	*583,298
Total	11,644,525	12,983,442	*1,338,917

* Imports less than exports.

Colossal Steel Ships.

The new steamer Servia, which has been built on the Clyde for the Cunard Company, is a larger vessel than the new Allan steamer Parisian, launched a few days ago, and is in all respects more remarkable. This vessel is the largest afloat, with the exception of the Great Eastern, being of 8500 tons register, but with capacity to carry 9300 tons. The hull, as in the Parisian, is made of steel, and on this account the performances of these latest additions to the magnificent fleet of English ocean steamers will be watched with much interest. It is claimed that by using steel instead of iron greater strength is obtained, while in the case of the Servia there is less dead weight in the hull by 620 tons than would have been the case with iron, and consequent saving in draught of water. The chairman of the Cunard Company, in his speech on the occasion of the launch, spoke of the immense strides made during the past 40 years in steamship building. The first Cunard steamer, the Britannia, was 128 feet long, 20 feet in beam, 10 feet deep and had a tonnage of 175 tons, and steamed 8 knots per hour, while the Servia's dimensions and capacity were as follows: Her extreme length is 530 feet, with a breadth of 52 feet, while her depth is 44 feet 9 inches. Her gross tonnage is 8500, while the cargo capacity is equal to 6500 tons, with 1800 tons of coal and 1000 tons of water ballast. The hull is built throughout of steel, and has a double bottom. The engines have an indicated power of 10,500 horses. There are five decks, but the principal are the upper, main and lower. The vessel is to have three masts and two funnels, and will be bark-rigged, with pole topmast and top gallantmast. The saloon measures 74 feet long by 49 feet wide, and here it is calculated 350 persons can easily be accommodated at meals. On the upper and lower decks there are 108 state rooms, with accommodation for 450 first-class passengers, and, when necessary, no less than 2000 emigrants can be comfortably carried. In accordance with the Admiralty requirements for war purposes, the Servia has been built with nine water-tight bulkheads. She is expected to steam 17½ knots per hour. The chairman further stated that his belief was that, great as the change during the past years had been, we were on the eve of still more startling ones, to so great a pitch of daring invention had scientific skill been carried.

The Work at Hell Gate.

General Newton reports very satisfactory progress in the work of tunneling the rocks at Hell Gate preparatory to blowing up the bed of the river. There has been very little interruption through the winter. The appliances and the methods are the same that have been used heretofore. The task at Flood Rock is now about half completed, and it is expected that the final grand explosion will take place two and a half or three years hence. The original estimate of $5,000,000 for the entire work will probably not be exceeded. While the excavation at Flood Rock is in progress, work is being prosecuted at other points, giving promise of a channel deep enough to permit steamers of the largest size to pass in safety. Gen. Newton anticipates the time when canal boats and other craft can enter East River from the Hudson by a ship canal along the Harlem River, giving a more commercial character to that part of the city, and in a measure diverting the course of trade from Sandy Hook.

There are ten longitudinal tunnels 600 feet in length, crossed at right angles by thirteen which are much shorter. Above them is the rock flooring, 12 feet in thickness. Ten drilling machines cut 250 holes every day, each of which is 2 inches in diameter and four feet thick. When all is in readiness, 400,000 pounds of blasting powder will be fired by a single electric spark passing through the connecting wires, instantly lifting up nine acres of rock from the river's bed and shattering the whole mass to fragments. The tunneling by that time will have been extended to about five miles, the progress meanwhile being at the rate of about 120 feet a week. Although the explosive force employed will be four times greater than when the memorable explosion at Hallett's reef took place, the earthquake occasioned will be of a harmless character. The event now anticipated will signalize one of the most extraordinary achievements in engineering of which we have any record.

Agricultural Implements.

As remarked the other day by an inventor whose name is known the world over, "We want no more men to mow and reap, only hitch on a horse and the machine runs itself." Improvements are constantly making. The latest special feature is the substitution of twine for wire, which injures the burr-stones of flouring mills, and becomes mingled with the fodder given to animals. A number of manufacturers are experimenting with improved machines, but of thirteen exhibited at a recent show out West, only three did good work. The number which go into use among the farming community to the Western States is enormous. A leading concern sold last season 5000, the retail price being from $275 to $300 each, and of the total made, from 10 to 20 per cent. are exported. It is observed that the principal shipments this season are to France, England, Germany and Russia, and it is predicted that he exports of agricultural machinery this year will be larger than one year ago, though it is rather early to speak on this point, as the export movement dates from January 1, culminating in May, and continuing to South America, Australia and New Zealand as late as September 1. Shipments to France are made direct, and those for Germany to Hamburg, but a large proportion of the aggregate exports go to Liverpool and London, the great distributing points for the Continent.

The enormous productiveness and extent of our grain-growing territory calls for a corresponding increase in facilities for handling the crops. Accordingly, great warehouses have sprung up in Chicago, the main point of supply for the Northwest. The increase has been rapid for the last two years, until now, as estimated by one of our best informed manufacturers, the total number of grain and hay-cutting machines turned out in the United States this year will verge hard on to 75,000, the market value of which we will say is $12,000,000. One of our establishments is making over 30,000—at present running night and day—while two others make 7000 to 12,000 each. This estimate applies only to a special class of implements, besides which are threshers, cultivators, plows, horse-rakes and harrows, so that if all are included the figures above given would be fully doubled.

In another point of view the subject is no less interesting; that is, the consumption of materials which enter into the construction and use of machinery of the character described. We are able to state on authority, that one concern engaged in building mowers and reapers has a twine bill amounting to a round $500,000 per annum. Making a simple calculation, the estimated amount of twine sold or used in connection with reaping machines will be 2500 or 3000 tons, valued at say $900,000, as every machine must have its outfit of twine. The high price of hemp last season forced manufacturers to contract for sisal and manila mixed, and this twine is tested at 70 to 75 pounds tension.

As to the high character of American implements there can be no doubt. At the recent international exhibition at Melbourne the leading manufactures were all represented; and recent information shows that at a field trial between these and the English machines, Walter A. Wood's took the first prize, McCormick's the second and Osborne's the third. There is a steadily increasing demand for American machines in Australia, New Zealand and South America. Many are sent to South Africa. It is known, however, that some of our exporters have lost heavily by forcing their goods on the market before they are sold. There have been several very unprofitable ventures, especially in the British Colonies.

Twenty steel floor beams have been laid on the Brooklyn side of the great East River suspension bridge, affording some conception of the future appearance of the finished structure.

Improved Marine Boiler and Engine.

The boilers and machinery for Mr. E. E. Roberts' steam yacht, building in Frank Bates' yard, South Brooklyn, are in several respects peculiar. There is a coil boiler, intended to carry, if necessary, 300 pounds pressure per square inch. It has 9 square feet of grate surface and about 220 square feet of heating surface. A forced circulation is maintained by the operation of an auxiliary engine. The engines are of the compound type, the high-pressure cylinder being 5 inches in diameter by 5 inches stroke of piston, the steam being exhausted into the separator, which mechanically extracts the water of condensation from the steam, the former passing automatically through a trap into the hot well, while the remaining steam is used over again in the low pressure cylinder of 9 inches diameter by 5 inches stroke. The cranks of the two engines are set at a right angle, so there are no dead centers. The valves are of the balanced piston variety, and are both operated by one shifting eccentric, so as to reverse or work the steam expansively. The air pump is a displacement pump, arranged with a water piston, so that the velocity of the latter is only about one-sixth of the velocity due to the speed of the engine, to which it is directly attached by means of a yoke worked from the crosshead of the low pressure engine through a pair of links and rocker bars. The same yoke also drives the two feed pumps, which receive their water under a "head" from the hot well, after having the oil (previously used in the cylinders) extracted by being filtered through a sponge. The condenser is of the external, surface type, consisting simply of a pipe around the after part of the boat, and covered by the water in which she is immersed. A fresh water tank, holding 180 gallons, is placed in the center of buoyancy of the yacht, so as not to affect her trim, whether full or empty. The grate bars consist of square wrought iron bars, on which are strung small castings in the shape of cutters, like beads on a wire. The propeller is a true screw, with a slight forward curve on the ends of the blades (three in number) to counteract the centrifugal tendency. It is 36 inches in diameter and 54 inches pitch. The propeller shaft is 2¼ inches in diameter and the crank shaft 2 inches, the latter being of steel, as are all other working parts of the engines. The engines are forward of the boiler, the propeller shaft passing under an arch in the ash-pan, thus enabling the yacht to be handled by one man, who stands in such a position that the steering wheel and reversing lever are on either side of him.

A Flying Switch Before a Jury.

Wonderful are the ways of juries and lawyers when a railway company is in the case! The general manager of a Chicago road tells the following bit of his experience, which will do as an illustration: The engineer of a passenger train in motion on this road, one day saw right ahead of him a push car which two men were pushing toward him. It turned out afterward that the men had stolen the car and taken it up to the next station, and put on a barrel of flour which they were bringing home. The engineer whistled, but the men, not being railway employees, were so bewildered that they failed to get the car off ere the engine struck it, smashing it to pieces, while a flying part of a wheel struck a little child who happened to be playing at the side of the road, injuring her foot so that a portion of it had to be amputated. Although the liability of the railway company for this singular occurrence would seem to the unprejudiced observer exceedingly remote, it is needless to say that the jury brought in a verdict of damages against the company.

During the trial the attorney for the plaintiff produced a copy of the company's rules and proceeded to show that its employees were guilty of violation of their duties, by triumphantly quoting a rule providing that "flying switches are positively prohibited!" "Now, gentlemen of the jury," said he, "here was a switch right at the point where this accident occurred, and this train was flying at full speed right past it, in high-handed violation of its rules." He claimed judgment against the defendant for gross violation of its own rules, to the danger of the public. The superintendent asked permission to explain the meaning of the rule, but the lawyer stoutly objected. He did not want the jury influenced by the talk of this railway official. The court, however, kindly allowed the superintendent to inform the intelligent jury that making a flying switch did not mean running past a switch, as such a rule would decidedly interfere with running trains at all, but was a prohibition against the old practice of cutting off cars while under way, and running them on to a switch without stopping the train. The explanation evidently did not make a very great impression upon the jury, since, as we have said, they found for the plaintiff.

The Potts Nickel Solution.—The Enterprise Mfg. Co., Philadelphia, have just completed arrangements under which they will manufacture and sell the Potts patent nickel solution. The patentee, Mr. Joseph H. Potts, has been in charge of their nickel-plating department for some five years, and this solution is the result of protracted and patient investigation. It cannot be called an experiment, for it has been used by the Enterprise Mfg. Co. for more than a year, plating sad-irons, stove work, brass, steel and composition metals to their entire satisfaction. A very beautiful specimen of its work is now before us. In addition to such claims as economy of nickel, smoothness of deposit, maintenance of metallic strength, &c., it is also claimed that this solution does not infringe any patent; and the fact that the Enterprise Company, after careful investigation, have adopted and used it in preference to all others, entitles it to a consideration which would scarcely be accorded to an untried invention in this line.

A movement is taking form in Chicago to build an underground railway from the river north to the city limits, in connection with the proposed rapid transit system to Evanston and Lake Forrest. The cost of tunneling and laying a track in the tunnel to the city limits is estimated at $2,600,000.

Subterranean Electric Cables.—Among the novelties exhibited at the last monthly meeting of the Franklin Institute, was the system of underground telegraphy invented by Restore B. Lamb and owned by the National Subterranean Electric Company. Terra-cotta blocks, through which there are a number of small holes glazed inside and out, are used. The pipes or blocks are joined together, much like sewer pipes, and cemented, the holes being continuous. Cables of wires, inclosed in rubber tubes, are carried through the holes. At convenient distances along the route are masonry chambers underground, entered from a manhole, in which the sections of tubular blocks terminate. In these the connections between two sections and repairs are made, the wires or cables requiring repair being drawn through the chamber and replaced. The wires are amply protected from the weather and thoroughly insulated from each other, and, having once been laid, the streets through which they pass do not have to be disturbed to add additional wires as required or to make repairs. Satisfactory experiments with the system have been made in Camden, where the "blocks" have been laid through swampy "made" ground for several months.

Carnegie Bros. & Co.—The Pittsburgh *Times* of the 18th says: "A plan has recently been matured whereby the immense business of one of the largest firms in the country will be concentrated under one generalmanagement. The scheme alluded to is one to bring under one head the numerous industries in which the Carnegie Brothers are interested, either as sole owners or owners of controlling interests. They are the following: The Edgar Thomson Steel Works, Union Iron Works, Lucy furnaces and ore mines at Tyrone, Larimore Coke Works at Carpenter's Station, and the Monastery Coke Works at Latrobe. It is probable that all of these interests will be combined under one general manager, and that general offices will be opened in this city. The title of the new firm will be Carnegie Bros. & Co. A *Times* reporter called at the office of the Edgar Thomson Steel Company yesterday afternoon, and was informed that the firm at present did not consider their business a matter of public scrutiny. However, the gentleman in the office who did the talking, said that a full announcement of their changes would be made through the press about the first of April."

In the early future india rubber ought not to be an expensive article. According to information concerning the plant which produces Ceara rubber, contained in the report on india rubber by Dr. H. Trimen, of Ceylon, the plant is very hardy, and will grow in a dry, rough soil, and a moderately dry, hot atmosphere, while the Para and West India rubber plants require a rich alluvial soil, and a constantly hot-moist atmosphere. Ceara rubber plants have been found to succeed in Ceylon, Calcutta and Madras, but the climate of Singapore is too wet for them. It is suggested, says the *Journal* of the Society of Art, that plantations should be formed on exhausted coffee land. The tree grows to about 30 feet or more in hight, and forms a dense rounded crown. It attains a diameter of 4 inches or 5 inches in about two years, when it may be tapped.

The Supreme Court of Maine has decided that where goods are delivered to a railroad company by a connecting railroad company, to be transported to the owners, and the same are received by said company for the purpose, it becomes its duty to send them off immediately, and it cannot justify the detention of the goods on the ground that, by its regulations, goods received by a connecting road are not to be forwarded until the receipt of a bill of back charges, and that no such bill accompanied the goods.

A preliminary exhibit of the "wealth, debt and taxation" of the State of New York has just been completed by the census office. The "wealth" statistics place the valuation of real estate in 1880 at $2,326,669,813, and personal property at $352,469,320; total, $2,679,139,133. The total local indebtedness, December 31, 1879, is placed at $248,766,118.87; total amount of taxation, $52,467,407.19.

The men employed at Krupp's manufactory are working night and day in supplying orders for large guns from abroad. Roumania has ordered 100; Greece, 700; Sweden, 50; Holland, 120, and Italy, 400. In the presence of facts like these it is a little difficult to perceive from which direction the millenium is approaching.

Bolckow, Vaughan & Co., Limited, made a profit of $1,645,700 during the year 1880, on a capital of $17,600,000. A dividend of 8¾ per cent. on the common stock was declared and $425,000 was added to sinking and reserve funds and carried forward as a balance.

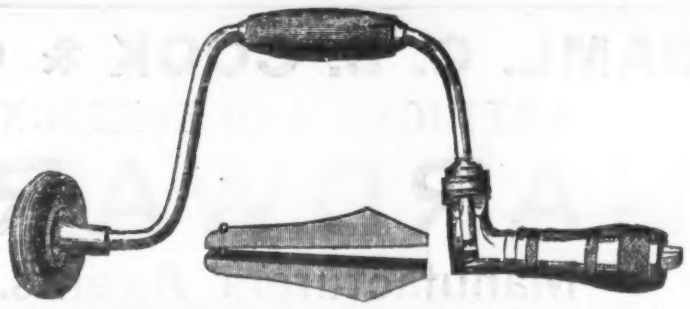
The imports at Montreal for the two months ending February 28, amount to $4,906,000, which is an increase of over 25 per cent. compared with the corresponding months in 1880. Of the total, nearly $200,000 was for iron, machinery, &c.

The coroner's jury in the case of the victims of the recent boiler explosion at Buffalo has found that the disaster was caused by an over-pressure of steam in testing the boiler, which "was not provided with any safety-valve, cock or pipe."

During a series of experiments made under the auspices of the French postal authorities, Dr. Cornelius Herz succeeded in transmitting audible speech a total distance of 800 miles with the aid of his telephone system.

Dr. Francisco Garcia Calderon, nominated as President of Peru, is busy in the preliminary work of establishing a government, and will be at once recognized by the Chilian ministers.

The Hudson River Tunnel has advanced 400 feet under the bed of the river.



Though we have occupied this identical space in *The Iron Age* for more than twelve years, and though we have been the leading Bit Brace manufacturers of this country during all that time, we have seldom spoken of it in our advertisement, for the reason that all the leading dealers were supposed to know it. Since we first put

THE BARBER IMPROVED BIT BRACE

on the market, at least a dozen patent braces have run their race through the stores and junk stores, and are now forgotten. It is true, some of them died violent deaths, but most of them perished from constitutional weakness. We do not offer to meet competition, as no one else can make our Brace, and we have nothing to compete with. Others might if they would make their braces of steel, but it is much more expensive, and no one can tell the difference until the brace is put into use. All of our Nickel-Plated Braces are made of rolled steel, with forged steel jaws, which will never wear out. We formerly made malleable iron jaws, which in time wore out. All such we will now replace with steel for 25 cents per pair. They are all one size and will always fit. Our Ratchet Brace at the present time has no competitor in the market. Dealers who sell other styles of braces will find it to their interest to buy their stock of ratchets from us.

The price of Barber Braces has not been changed for many years, and we do not anticipate any variation in the near future. Thanking our customers for past favors, we now solicit their future orders.

MILLERS FALLS CO.,
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Hardware Commission Merchants,
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E. & G. BROOKE'S "Anchor Brand" Nails, Brads, Spikes, &c.
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UNION MANUFACTURING CO.'S Butts.
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With Attachment for Taking the Tare.
Manufactured by
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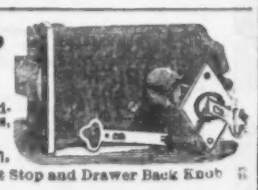
Manufacturer of Patent
BRASS PAD LOCKS
For Railroad Switches, Freight Cars, and the Hardware Trade. All sizes, with Brass and Steel Keys, with and without chains.
Patent Horizontal Rim Cylinder Night Latch.
Self-adjusting to doors of any thickness, with Patent Stop and Drawer Back Knob RIGHT OR LEFT HAND.



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PORTABLE DRILLS. Driven by power in any direction.
RADIAL DRILLS. Self-feed—Large Adjustable Box Table.
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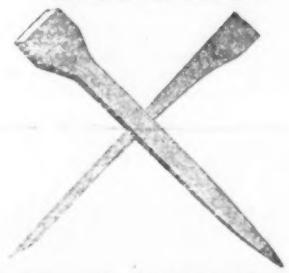

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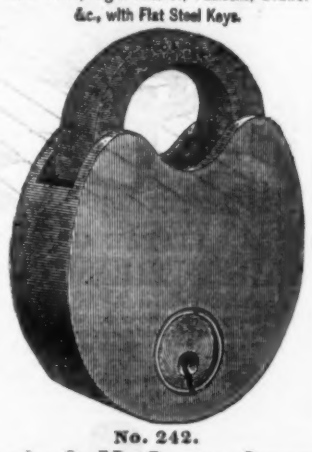
Store Door Locks, Night Latches, Padlocks, Drawer Locks, &c., with Flat Steel Keys.

FOUR SIZES, Plain and with Chain—Flat Keys, Safe.



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Forged Horse Shoes,
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Patent Toe Calks,
Superior to any in market.
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PHOSPHOR-TIN!

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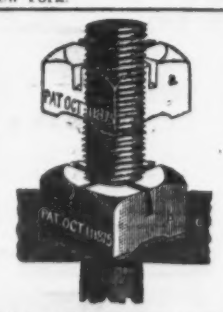

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a, Atwood Nut on bolt without bearing on base—slots open. b, Atwood Nut turned to bearing c, partially closing the slots and grasping the bolt.

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MANUFACTURED BY
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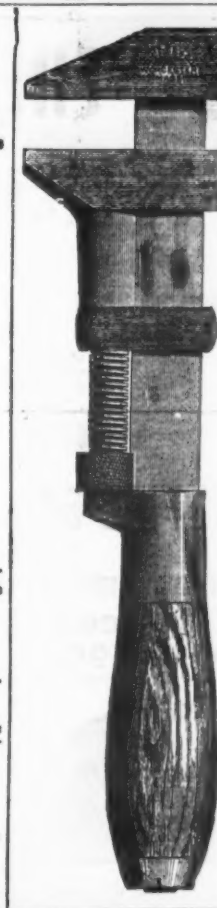

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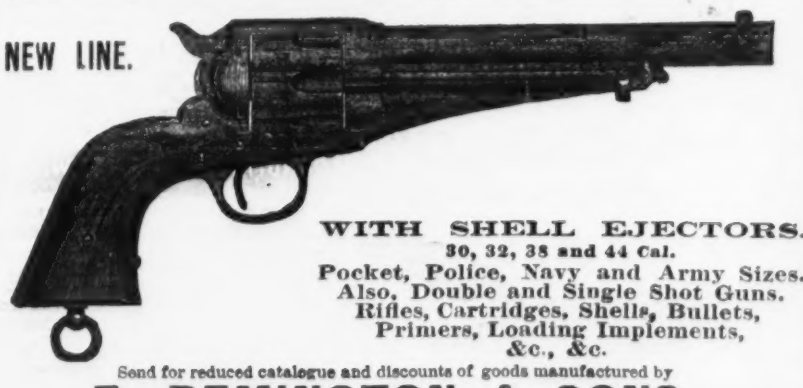

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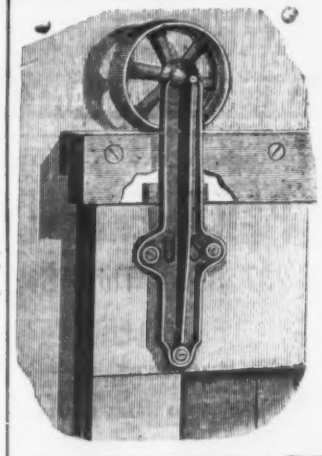

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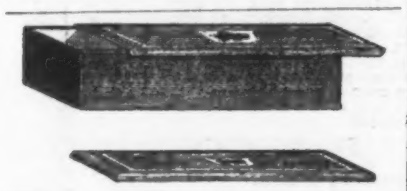

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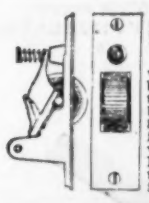

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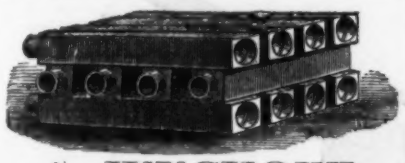

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At price of ordinary Curry Combs.
Exclusively manufactured by us under Norton's patent.
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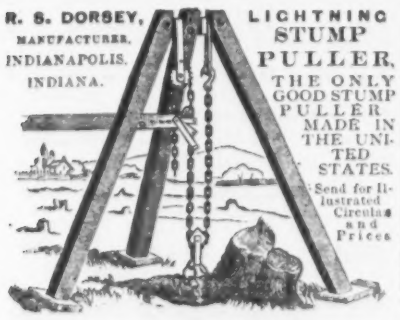
R. S. DORSEY, MANUFACTURER, INDIANAPOLIS, INDIANA.



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Office, 901 Pine St., St. Louis, Mo.

Everyone Their Own Window and Door-Screen Maker
by using PORTER'S METALIC CORNERS AND WINDOW AND DOOR SCREEN STICKS.
Hardware Dealers, Carpenters, Cabinet and Screen-frame Makers. Also agents will find a ready sale for these goods.
ORNAMENTAL, USEFUL, CHEAP AND DURABLE.
No Mortising or Tenoning. Cannot sag or warp, and anyone that can turn a screw can make them.
Thousands are now in use. Can be used for either upper or lower window, and not in the way of shutting or opening your blinds from inside or outside.
SEND FOR PRICE-LIST.
Porter Manufac'g Co.
BURLINGTON, VT.

WESTON DYNAMO-ELECTRIC MACHINE

NICKEL.

The rapid increase in the use of Nickel-Plating owing to the introduction of the Weston Machine and the very low price of nickel material, enables us to give greatly reduced estimates for complete outfits.

We are furnishing outfits specially adapted for Stove Work, giving a pure white deposit on plain or mat surfaces.

Outfits complete, with Dynamo-Electric Machine Tanks, Anodes, Solution, &c., &c., $250.

We beg to refer to the following Stove Manufacturers among 500 other houses using the Weston Machine: Richardson & Boynton, S. S. Jewett & Co., Fuller, Warren & Co., Perry & Co., Detroit Stove Works, Michigan Stove Co., Co-operative Stove Co., E. & C. Gurney, Hamilton & Toronto, and many others

INFRINGEMENTS.

We call attention to infringements of the Weston Machine, in which Automatic Switches are used to prevent change of current. The Weston Co. are owners by grant or purchase of all forms of Automatic Switches for Plating Machines. The adoption of these machines will certainly lead to great loss to parties purchasing or using them.

CONDIT, HANSON & VAN WINKLE
Sole Agents, NEWARK, N.J. U.S.A.
NEW YORK OFFICE, 92 & 94 Liberty St.
ENGLISH AGENCY: 18 Caroline Street, Birmingham.

THE BELMONTYLE OIL
PREVENTS RUST, TARNISH, &c.,
on Fire Arms, Machinery, Tools, Cutlery, Safes, Saws, Skates, Stoves, Hardware, &c., without injury to the polish. In use over 10 years. Highest testimonials. Samples, 50 cents; three for $1.00; sent free of expressage. Send for Circular.
BELMONTYLE OIL CO., Sole Manufacturers,
150 Front St., New York.

STEEL BRASS RUBBER **STAMPS** STENCIL BRANDS PAINT *STAMPING INK &c.*
A.M. MICHAEL, ALBANY, N.Y.

A. PARDEE, Hazelton, Pa. J. G. FELL, Phila.

A. PARDEE & CO.,

237 South Third St.,
PHILADELPHIA,
No. 111 Broadway, New York.

MINERS AND SHIPPERS OF

Lehigh Coals.

The following superior and well-known Lehigh Coals are mined by ourselves and firms connected with us, viz.

A. Pardee & Co. { HAZLETON, CRANBURY, SUGAR LOAF.
Pardee, Bro. & Co. LATTIMER.
Calvin Pardee & Co. HOLLYWOOD
Pardee, Sons & Co. MT. PLEASANT.

BLACKSMITHS, HARDWARE MEN AND AGENTS SHOULD READ THIS

LITTLE GIANT
WAGON TIRE UPSETTER

This machine is strong, durable and cheap, and is superior to all others for upsetting or shrinking wagon tires and bars of iron without cutting them. It will upset tires one inch at a heat, and is adapted to tires of any size or diameter. Every Blacksmith should have one; they are the best selling machines hardware merchants and agents ever handled. Price only $12.00. Also,

THE DUPLEX SEAT LOCK.

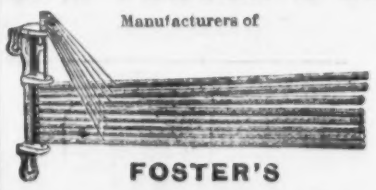
The best seat fastener ever invented. Light, strong, cheap, easily adjusted, and securely locks the seat to the wagon. Send for circular.

LITTLE GIANT MFG. CO.
Millport, Chemung Co., N. Y.

SAWING MADE EASY.
A boy 16 years old can saw off a 3-foot log in two minutes.

Our new portable **Monarch Lightning Sawing Machine** rivals all others. $50 cash will be given to two men who can saw as *fast* and *easy* in the old way, as one boy 16 years old can with this machine. Warranted. Circulars sent Free. Agents wanted.
MONARCH LIGHTNING SAW CO.,
163 Randolph St., Chicago, Ill.

C. A. FOSTER & CO.,
Manufacturers of



FOSTER'S
Improved Clothes Dryer.

Acknowledged by dealers to be the best and cheapest in market.
Fitchburg, Mass., U. S. A.

THE HARTFORD HAMMER CO.
Manufacturers of
Solid Cast-Steel Hammers
Under H. Hammond's Patent Process.
HARTFORD, - CONN., U. S. A.

SAML. G. B. COOK & CO.,

AMERICAN AND FOREIGN

HARDWARE

Manufacturers' Agents.
CUTLERY, CHAINS, &c.,
Nos. 67 and 69 German Street,
BALTIMORE, MD.

REPRESENT:

AMERICAN SCREW CO.
AMERICAN MACHINE CO.—Fluting Machines, &c.
BRANFORD LOCK WORKS.
BARB FENCING WIRE.
BEARDSLEY SCYTHE CO.
"BOSS" MOLASSES GATES.
CARR, CRAWLEY & DEVLIN.—Hardware.
COWLES HARDWARE CO.—Spring Butts, &c.
CLARK M'F'G CO.—Blind Hinges and Latches.
H. CHAPIN'S SON.—Planes, Rules, Levels, Gauges.
JNO. CHATILLON & SONS.—Balances.
CLARK BROS. & CO.—Carriage, Tire and other Bolts.
A. FIELD & SONS.—Tacks, Finishing and Shoe Nails.
HUBBARD, BAKEWELL & CO.—Axes.
KIESER'S MEAT CUTTERS.
KLEIN, LOGAN & CO.—Picks, Mattocks, Grub Hoes, Hand and Sledge Hammers and Fire Shovels.
KIMBALL'S Patent Solid Cast Steel Shovels and Spades.
LOCKWOOD'S Patent Solid Steel Hoes.
LANCASTER BOLT CO.—Eagle Carriage Bolts.
LANCASTER CHAIN WORKS.
LAMSON & GOODNOW MANUFACTURING CO.—Table Cutlery, Butcher Knives, &c.
LAWSON & BRENIZER.—Hay & Manure Forks.
MERIDEN BRITANNIA CO.—Plated Ware.
WM. McNIECE.—Hand, Rip, Compass and other Saws.
NORTHWESTERN HORSE NAIL CO.
NICHOLSON FILE CO
NAUGATUCK CUTLERY CO.—Pocket Cutlery.
PECK BROS. & CO.—Brass Cocks.
PAYSON M'F'G Co.—Sash Fasts, &c.
PATTON M'F'G CO.—Enameled and Tin Hollow Ware.
ROY & CO.—Wrought Hinges and Butts.
ROGERS BROS.—A1 Plated Spoons, Forks, &c.
SARANAC, DRUID and INTERNATIONAL HORSE NAILS.
WILSON M'F'G CO.—Mills, Vises, &c.
WALKER'S Patent Horse and Mule Shoes.
And Other Manufacturers of Hardware.

Also, a full line of Joseph Rodgers & Sons', Wostenholms', and other makes of Cutlery, &c.

LOGAN & STROBRIDGE,

New Brighton, Pa.,
Manufacturers of
COFFEE MILLS,
Corn and Spice Mills,
HOUSEFURNISHING HARDWARE.

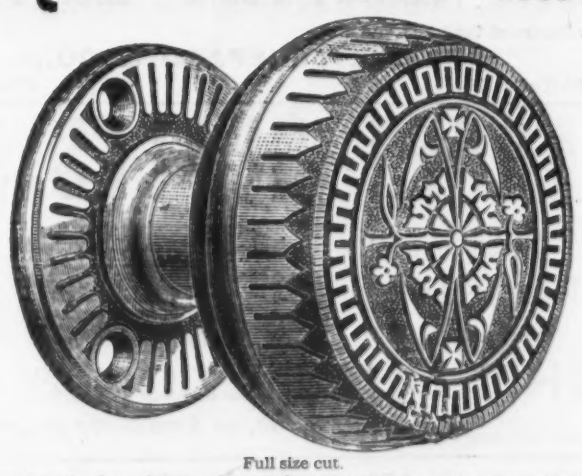
Also,

Gate Latches,
Gate Hinges,
Door Bolts,
Well Wheels,
Barn Door Hangers,
And all kinds of Light Castings.

Send for Catalogue and Prices.

BRANFORD LOCK WORKS,

ANTIQUE PATTERN KNOBS.



Full size cut.

We have issued, under date of June 10, a complete revised Price List, a copy of which, with our 1879 Illustrated Catalogue, will be furnished to the trade free on application. Said Catalogue contains illustrations and descriptions of over 1000 different varieties of Door Locks, Knobs and Escutcheons.

MANUFACTORY AND OFFICE
BRANFORD, CONN., U. S. A.

W. K. Ross,

97 CHAMBERS ST., NEW YORK.

SCYTHES & SNATHS,

FORKS, HOES & RAKES

FOR EXPORT.

The Iron Age Directory

and Index to Advertisements.

NEW YORK WHOLESALE PRICES, March 23, 1881.

METALS.

IRON.—DUTY: Bars, 1 to 1½c. ₩ lb; Sheet, Band Hoop and Scroll, 1¼ to 1¾c. ₩ lb; provided, that none of the above Iron shall pay a less rate of duty than 35 per cent. Pig, $7 ₩ ton; Polished Sheet, 3c. ₩ lb; Wrought Scrap, $8 ₩ ton; Cast Scrap, $6 per ton. Railroad, 70c. ₩ 100 lbs. Boiler and Plate, 1¼c. ₩ lb.

IRON—AMERICAN		
Foundry No. 1	₩ ton	$24.00 @ 26.00
" No. 2X	₩ ton	22.00 @ 23.00
Gray Forge	₩ ton	20.00 @ 21.00
SCOTCH.		
Eglinton	₩ ton	22.00
Carnbroe	₩ ton	22.50 @ 23.00
Coltness	₩ ton	24.50 @ 24.75
Glengarnock	₩ ton	23.00 @ 23.50
Gartsherrie	₩ ton	23.00 @ 23.50
Rails.		
Iron	₩ ton	$42.00 @ 45.00
Steel (at mill)	₩ ton	63.00 @ 65.00
Old Rails	₩ ton	27.50 @ 30.00
Scrap.		
Wrought Scrap ₩ ton		30.00 @ 31.00

Bar Iron, from Store.—

Common Iron:		
¾ to 1 in. round and square	₩ lb	2.30
1 to 6 in. x ¾ to 1 in.	₩ lb	2.30
Refined Iron		
¾ to 1 in. round and square	₩ lb	2.50
1 to 6 in. x ¾ to 1 in.	₩ lb	2.50
6 to 6 in. x ¼ and 5-16	₩ lb	2.70
Rods—¾ and 11-16 round and square	₩ lb	2.60
Bands—1 to 6¼ x 16 to No. 13	₩ lb	2.10
Norway Nail Rods		6¾ @ 6¾c

Sheet Iron.

	Common American	R. G. American.
10 to 20	₩ lb 3¾c	4c
21 to 24	₩ lb 3¾c	4c
25 to 26	₩ lb 4¼c	4¼c
27	₩ lb 4¼c	4¼c
28	₩ lb 4¾c	4¾c
	B.B.	2d qual.
Galvanized, 10 to 20	₩ lb 7¼c	7c
" 21 to 24	₩ lb 6¾c	7¼c
" 25 to 26	₩ lb 6c	6c
" 27	₩ lb 5¾c	6¼c
" 28	₩ lb 10½c	9c

Patent Planished ₩ lb 11c; B. 10c
Russia 11¾ @ 12½c
American Cold Rolled ₩ lb 5 @ 7½c

COPPER.—DUTY: Pig, Bar and Ingot, 5c; Old Copper 4c ₩ lb; Manufactured (including all article of which Copper is a component of chief value), 45 ₩ ad valorem.

American Ingot ₩ lb See Trade Report

SHEATHING, BRAZIERS COPPER, BOLTS, &c.

Braziers' Copper, ordinary sizes, 14oz. per sq. ft., and over per lb	28c
Braziers' Copper, ordinary sizes, under 16 oz. and over 12 oz., ₩ sq. ft.	₩ lb 30c
Braziers Copper 10 oz and 12 oz., ₩ sq. ft.	₩ lb 32c
" Lighter than 10 oz. ₩ sq. ft.	₩ lb 34c
Circles less than 24 in. in diameter	₩ lb 31c
Circles 24 in. diameter and over	₩ lb 240
Segment and Pattern Sheets	₩ lb 310
Locomotive Fire Box Sheets	₩ lb 26c
Sheathing Copper, over 12 oz. ₩ sq. ft.	₩ lb 26c
Bolt Copper	₩ lb 28c
Copper Bottoms	₩ lb 29c

No Copper in Sheathing except 14 oz. inches and not to exceed 34 oz. to the sq. ft.

TINNING.

14x48	₩ sheet 6c

All other size Sheets, 2½c. per square foot.
For tinning both sides, double the above amount

O'REILL'S PATENT PLANISHED COPPER.—Net.

	Cut.		Cut.
24 and 22 oz. and heavier	₩ lb 36c	By the case	₩ lb 34c
20 oz. and lighter	₩ lb 39c	"	₩ lb 38c

Boiler Sizes.

7 in., 14x52.	8 in., 14x56.	9 in., 14x60.	
24 and 18 oz. and heavier	₩ lb 36c	By the case	₩ lb 37c

(And all sizes not over 20 in. wide.)

30x60.

14 and 16 oz. and heavier	₩ lb 40c
2 oz.	₩ lb 430

Brass.

Brown & Sharp's Gauge the Standard for Meta Old English Gauge the Standard for Wire.

BRASS MANUFACTURERS' PRICE LIST.—dis 20%.
June 10, 1880.

Cash prices for Roll and Sheet Brass. For less quantity than 100 lbs. add 30 ₩ lb.

HIGH BRASS.

All Nos. not thinner than No. 28, wider than 2 in., not wider than 14 in	30c
All Nos. to No. 28, inclusive, and widths over 14 to 20 in., inclusive	31c
All Nos. to No. 28, inclusive, and widths over 20 to 30 in., inclusive	32c
1c ₩ lb advance on each No. above Nos. 26 to 28, inclusive.	
All Brass thinner than No. 8 is Platers' Brass, at	43c
Sheets 24x48, and all sheets cut to particular sizes and lengths under 30 in., in width wider than 2 in.	37c
Printers' Rules	45c
Sheets wider than 30 in. and under 40 in.	47c
" 40 in. and over	50c
Circular Sheets, in diam. from 4 in. to 14, inclusive	30c
" " " over 14 " 20, "	45c
" " " " 20 " 30, "	45c
" " " " 30 " 40, "	44c
" " " 40 in.	49c

LOW BRASS.

4c ₩ lb more than High Brass,
Gilding Metal, 8c ₩ lb more than High Brass.

laters' or Gold Metal	In Bars	48c
	Sawed	51c
	Planed or Polished	44c

FOR SLITTING.

Metal in width 2 in. to 1½ in. to No. 28, inclusive, 1c. ₩ lb advance.
Metal, in width 2 in to 1 in. thinner than No. 28, 2c. ₩ lb advance.
Metal, in width 1 in. to ¾ thinner than No. ₩ lb advance.
Metal, in width ¾ in. to ¼, inclusive, not thinner than No. 26, 2c. ₩ lb advance.
Metal, in width ¾ in. to ¼ thinner than No. 28, 4c. ₩ lb advance.
Metal, ¼ in. in width and less, 10c. ₩ lb advance.
Any of the above widths cut to particular lengths, add 7c. ₩ lb.

GERMAN SILVER MARKET METAL AND WIRE.

	Market Metal.	Wire.
4 per cent., 12 inch, to No. 26	$0.42	$0.70
6 " " "	.55	.75
10 " " "	.64	.90
14 " " "	.74	1.03
18 " " "	.80	1.12

German Silver Sheets over 12in. wide and weighing more than 10 lbs., $2.00 ₩ lb.
Advance 2c. for each additional inch in width above 12 in., and 2c. ₩ lb on each No. thinner than Nos. 26 to 36, inclusive
All German Silver thinner than No. 36 is Platers, at 40c ₩ lb additional.
Germad Silver Scrap one-half less than net price of 12 in Market Metal. German Silver Turnings, Filings and Chips, half the price of Scrap.

BRASS AND COPPER WIRE.

	High Brass.	Low Brass.	Gild'g and Copper.
No. 0 to 20	$0.35	$0.37	$0.13
No. 21	.36	.40	.46
No. 22	.37	.41	.47
No. 23	.38	.42	.48
No. 24	.40	.44	.50
No. 25	.43	.47	.54
No. 26	.44	.49	.55
No. 27	.48	.52	.58
No. 28	.52	.56	.63
No. 29	.55	.59	.66
No. 30	.58	.62	.74
No. 31	.62	.66	.78
No. 32	.66	.70	.84
No. 33	.70	.74	.93
No 34	.74	.78	1.03

Spring Wire 2c ₩ lb advance.
Flat, Square and Half Round Wire 4c ₩ lb advance on Round Wire.
Fancy Wire not less than 10c ₩ lb advance of Round Wire
Brass Rods, No. 8 and larger, not less than 2 feet lengths, 38c.
Wire straightened and cut, smaller than No. 8, and not less than 2 feet lengths, 43c.
Wire and Rods less than 2 feet lengths, special rates
Twelve cents per lb extra for spooling on 1 lb spools.

MISCELLANEOUS.

Brass Pail Ears	$1.40
Brass Door Rail	.85

SCRAP.—dis. 20 %

High Brass Scrap	.12c
Low "	.14c
Gilding "	.16c

Turnings, Filings and Chips half the price of Scrap.
Terms—Net cash. Interest to be added after thirty days.

TUBING.—dis 20 %

Plain No. 2 inclusive above ¼ in. to 3 in.	60 & 13
" above 3 in.	.53

Nos. 21, 22, 23, two cents advance on List for each Number.
Nos. 24, 25, 26, four cents advance on List for each Number.
Above No. 26, special rates.

Plain, ¼ inch	.70
" 3-16 "	1.10
" ⅛ "	1.60

All Mandrel Drawn Tubes, 5 cents advance on List Prices.
Fancy Tubing to No 20 40c
English, Scotch and Extra Patterns Fancy Tubing to No. 20 55c
Tubing Sawed or Cut 2 to 4 feet long, 2 cents advance on List
Add to 2 cents ½ cent for each additional cutting under 2 feet.
All Mandrel Drawn Tubes under ¾ in. 25 cents per pound advance.

ZINC TUBING—dis 20 %.

Plain	.47
Patent	55
Etch and Extra Patterns	.32

GERMAN SILVER TUBING.—dis 10 %

4 Per cent.	.80
6 "	.90
9 "	1.05
12 "	1.20
15 "	1.35
16 "	1.40
18 "	1.50
20 "	1.60

STEEL.—DUTY: Bars, Ingots, Sheets and Coils valued at 7 cents ₩ lb., or under, 2¼ cents; over, 7 cents, and not above 11, 3 cents ₩ lb; over 11, 3½ cents ₩ lb, and 10 % ad val. Railway Bars, 1¼ cents ₩ lb. Railway Bars, in part Steel, 1 cent ₩ lb. Provided, that Metal cemented, cast or made from Iron by the Bessemer or pneumatic process, of whatever form or description, shall be classed as

American Cast Steel.

For American Steel see quotations under heading of Pittsburgh.

English Steel,—		
" Best Cast	₩ lb	15½c
" Extra Cast	₩ lb	16½c
" Round Machinery, Cast	₩ lb	10c
" Swaged, Cast	₩ lb	18c
" Best Double Shear	₩ lb	15½c
" Blister, 1st quality	₩ lb	13c
German Steel, Best	₩ lb	11c
" 2d quality	₩ lb	10c
" 3d quality	₩ lb	9c
Sheet Cast Steel, 1st quality	₩ lb	15½c
" 2d quality	₩ lb	14½c
" 3d quality	₩ lb	12½c

ANTIMONY See Trade Report.

LEAD.—DUTY: Pig $2 ₩ 100 lbs; old Lead, 1½c ₩ lb. Pipe and Sheet, 2½c ₩ lb.

American	4¼ @ 4½c
Bar	6c net
Pipe	6½c dis 10 %
Tin Lined Pipe	10c. dis 10 %
Sheet	7c. dis 10 %
Shot	Drop 7½c, Buck. 8½c
Chilled Shot	8½c

RABBIT METAL.

N. P. U	₩ lb 7½ @ 8c
A. 24c; B. 20c; C. 15c.	

TIN.—DUTY: Plates, Sheets, Tagger and Terne, 1.10 ₩ lb; Electro-galvanized Plates, 2c ₩ lb; Manufactures of, not enumerated, 35 per cent. ad. val. Bars, Block and Pigs free. Banca, subject to duty of 10 per cent.

Banca	24c @ 26c
Straits	₩ lb 21 @ 22c
English	21 @ 22c

TIN PLATES.

I C 10x14 } 14x20 }	Prime Charcoal	$6.25 @ 6.50
I C 12x12	"	6.50 @ 6.75
I X 10x14 } 14x20 }	Charcoal	8.25
I X 12x12	"	8.40
D C 12½x17		6.75
D X 12½x17		7.75

For each additional X add 2.00

COKE TIN PLATE.

	Best.	Ordinary.
I C 10x14 } I C 14x20 }	$5.00	4.25 @ 4.75
I C 12x12	6.25	5.00 @ 5.75

TERNE PLATE.

	Prime Char.	2d quas.	Coke.
I C 14x20	$4.50	4.25	3.00 @ 3.25
I X 14x20	7.00		
I C 20x28	11.00	11.00	10.00 @ 11.00
I X 20x28	14.00		
I C 20x200	22.00		
I C 14x20 M. F. Brand			7.75

SOLDER No. 1, 13c @ 13 c; No 2, 11c

SPELTER—DUTY: in Pigs, Bars and Plates, $1.50 ₩ 100 lbs.

American, cash	5¾ @ 5¾ c
Bergen Port from Lehigh Ore	10c
Lehigh, on spot	00

ZINC.—DUTY: Pig or Block, 1.50 ₩ 100 lbs. Sheet 2½c ₩ lb.

Sheet, Cask	7 @ 7½c
" Open	7¼ @ 8c

Paper Stock, &c.

(Dealers' Selling Price.)

White Shirt Cuttings, No. 1	6¼ @ 6¾
" " No. 2	5 @ 5½
Mill Assorted Whites	4½ @ 5
Unbleached Muslins	6½ @ 6¾
City Whites, No. 1	4½ @ 5
New Canton Flannels	6 @ 6¼
New Seconds, light	4¾ @ 4¾
" dark	3½ @ 3¾
No. 2, Whites	3¼ @ 3
Cotton Canvas	4¾ @ 4¾
Linen Canvas, No. 1	4½ @ 4¾
Seconds, City No. 1	1¾ @ 2¼
" No. 2	1½ @ 1¾
Colors, per 100 lbs	85 @ 90
Manila Rope	3¼ @ 3½
" Tarred	2½ @ 2¾
Gunny Bagging, No. 1	2¾ @ 2¾
" No. 2	1¾ @ 2
Kentucky Bagging	4¾ @
Burlap Bagging, No. 1	2¾ @ 2½
Tar Shakings	2 @ 2¼
Hemp Twine Stock	4½ @ 4¾
Hard White Shavings, No. 1	4¾ @ 5
Soft White Shavings, No. 1	4½ @ 4½
White Shavings, No. 2, soft	3¾ @ 3¾
Mixed Shavings, part white	3 @ 3¼
Ledger and Writing	3½ @ 3¾
Solid Stock	3¼ @
Book Stock, No. 1, light	1½ @ 1¾
Old Newspapers	2¼ @ 2½
Pure Manilas	2½ @ 2¾
Bogus Manilas and Hardwares	1¾ @ 1¾
Commons	90 @
Binders' Board Cuttings	1¾ @ 1½
Straw board Cuttings	1¼ @ 1¼

Paints, Oils, &c.

Paints.

Black Lamp, Coach Painters	₩ lb	20c
" Ordinary		6c
" Ivory Drop, fair	12 @	15c
" best		20c
Black Paint, in oil	kegs 8c	asst'd cans, 11c
Blue Prussian, fair to best	40 @	45c
" " " in oil	45 @	55c
Blue Chinese dry		83c
" Ultramarine	18 @	20c
Brown, Spanish		1½c
" Van Dyke	10 @	12c
Green, Chrome	15 @	23c
" " in oil	14 @ 18 @	20c
" Paris	good, 25c; best,	30c
" " in oil	30c;	40c
Iron Paint, Bright Red	₩ lb	2½c
" Brown	₩ lb	1½c
" Purple	₩ lb	3c
" Ground in Oil, Bright Red	₩ lb	4½c
" " " Brown	₩ lb	5c
" " " Purple	₩ lb	6c
Mineral Paints	¼ @	4c
Orange Mineral		10c
Red Lead, American		7½c
" Venetian (N. C.) dry	$1.65 @	$1.70
" in oil	asst'd cans, 11c; kegs,	8c
" Indian dry	9 @	12c
Rose Pink	10 @	13c
Sienna, American, Raw		4c
" Burnt		4½c
" " in oil	10 @ 16 @	20c
" Raw	11 @ 15 @	25c
Umber, Burnt	4 @	8c
" " in oil	9 @ 12 @	16c
" Raw	3½ @	7½c
" " in oil	10 @ 16 @	18c
Vermillion, Chinese		90c
" English	45 @	57½c
" Trieste		1.10c
" American, Common		15c
White Lead, American, pure dry		8c
" " in oil		7½c
White, Paris, English, prime	in bbls. 2 @	2½c
Yellow Ochre, French		$1.75
" " in oil	asst'd cans, 11c; kegs,	8c
" Vermont	in casks,	1½c
Yellow Chrome	17 @	27c
" in oil	14 @ 18 @	20c
Zinc White American No. 1, dry	5 @	5½
" No. 1, in oil		9c
" French (Paris)	8 @	10c
" in oil		@

Oils.

Linseed, Raw, in casks and bbls	gal.	58c
" Boiled " "		61c
Bleached Whale	₩ gal.	58c
" Sperm	₩ gal.	$1.12
" Elephant		65c
Signal		70c
Prime Lard		83c
No. 1		70c
West Virginia	13½ @	18c
Drilling		40c
Empire Cylinder		60c
Miners' Oil	35 @	45c
Fish Oil, pressed	40 @	43c
Neatsfoot		75c
Tallow		9½c
Machinery		40c
Engine		90c

Sundries.

Asphaltum		9c
Benzine	₩ gal	15c
Chalk		3c
" Block		3½c
Dryer, Patent, Am'n	asst'd cans, 5; kegs,	7c
Frostings		40c
Glue, White	24 @	35c
" Sheet		20c
Glaziers' Points, Zinc		8c
Gum, Copal		30c
" Damar		25c
" Shellac, English		16c
" " dark		12c
Litharge, English		7½c
Pumic Stone, selected Lumps	4 @	6c
" powdered		2½c
Putty, in bladders		3 c
" in bulk		2½c
Spirits Turpentine		38c
Whiting Spanish		1½c

Glass.

FRENCH WINDOW GLASS.

Prices current per box of 50 feet.

Single Thick.—Discount 50 & 10 %

SIZES.	1st.	2d.	3d.	4th.
6 x 8 to 10 x 15	$ 6.50	$ 5.75	$ 5.50	$ 5.25
11 x 14 to 16 x 24	7.25	6.75	6.25	6.00
18 x 22 to 20 x 30	9.25	8.50	7.75	7.25
15 x 36 to 24 x 30	10.25	9.25	8.25	
26 x 28 to 24 x 36	11.00	10.00	9.00	
26 x 36 to 26 x 44	11.75	10.75	9.50	
26 x 46 to 30 x 50	13.25	12.50	10.50	
30 x 52 to 30 x 54	14.00	13.00	11.25	
30 x 56 to 34 x 52	15.00	13.75	12.50	
34 x 58 to 34 x 60	16.50	15.00	13.25	
36 x 60 to 40 x 60	17.50	16.00	14.00	

Double Thick.—Discount 50 & 10 %.

SIZES.	1st.	2d.	3d.	4th.
6 x 8 to 10 x 15	$ 8.25	$ 7.75	$ 7.50	$ 7.00
11 x 14 to 16 x 24	10.00	9.25	8.75	8.25
18 x 22 to 20 x 30	12.75	11.75	10.75	
15 x 36 to 24 x 30	14.25	13.00	11.75	
26 x 28 to 24 x 36	16.25	13.75	12.50	
26 x 36 to 26 x 44	16.25	14.75	13.00	
26 x 46 to 30 x 60	17.50	16.75	14.25	
30 x 52 to 30 x 54	18.50	17.25	14.75	
30 x 56 to 34 x 50	19.50	18.25	16.25	
34 x 58 to 34 x 60	20.50	19.50	18.00	
36 x 60 to 40 x 60	23.00	21.00	20.00	

An additional 10 per cent. will be charged for all Glass more than 40 inches wide. Any size over 50 inches in length, and not making more than 81 unites inches will be charged in the 84 united inches bracket

Gunpowder.

New York Wholesale Prices, March 23, 1881.

HARDWARE.

Anvils.
Eagle Anvils American .... ₱ ℔ 10c dis 20 %
Wright's .... 10½c @ 11c
Armitage's Mouse Hole .... 9½ @ 9¾c
Trenton 10½c
Wilkinson's .... 10 c
Anvil, Vise and Drill.
Millers Falls Co., $28.00 .... dis 20 %
Augers and Bits.
Conn. Valley Mfg. Co. / Douglass Mfg. Co. / Humphreysville Mfg. Co. / Ives / Beecher (French, Swift & Co) / Griswold / Nobles Mfg. Co. / Kesson's Patent .... dis 40 % from list of Jan 7, 1880
Cook's, Douglass Mfg. Co. .... dis 40&10 %
Snell Mfg. Co.'s C. S. Augers .... dis 40 %
" " B. Machine .... dis 40 %
" " C. S Bits .... dis 40 %
" " Jenning's Bits .... dis 35 %
Patent Solid Head .... dis 30 %
Lewis' Patent Single Twist .... dis 33⅓ %
Russell Jennings' Auger, Dowel, Machine-Dowel and Hand-Rail Bits .... dis 10&10&10 %
Russell Jennings' Augers .... dis 16⅔&10&10 %
Russell Jennings' Car and Machine Bits, Boring-Machine and Millwrights' Augers dis 25&10&10&10 %
Imitation Jenning's Bits .... dis 40@45 %
Ives' "Jennings" Bits .... dis 33⅓&10 %
Andrews Bits .... dis 40 %
Expansive Bits, Clark's, small, $18; l'ge. $26 .... dis 25 %
" " Ives .... $20 @ $30—dis 33⅓ %
" " Blake's .... $20—dis 40 %
" " Parmelee's .... $20 and $30 .dis 33⅓ %
Hollow Augers Ives' / French, Swift & Co .... dis 20 %
" " Douglas .... dis 20 %
" " Bonney's Adjust .... ₱ doz $48—dis 25&10 %
" " Stearns' Adjust. ₱ doz $48—dis 20&10 %
" " Ives' Expansive .... each $4.50—dis 30 %
" " Univ'sal Expansive, each $4.50—dis 20 %
Woods .... dis 25 %
Gimlet Bits .... $7.50 ₱ gross, dis 45 %
" Diamond .... ₱ doz $1.10 dis 20&10 %
" "Bee" .... dis 35&5 %
Double Cut Gimlet Bits Shepardson's .... dis 40 %
" " Ct. Valley Mfg. Co ... dis 30&10 %
" " Hartwell's .... dis 60&10 %
" " Douglass' .... dis 40 %
" " Ives' .... dis 50 %
Morse's Bit Stock Drill .... dis 25 %
L'Hommedieu's Ship Augers .... dis 15 %
Watrous Ship Augers .... dis 15 %
" Extension Lip .... dis 30 %
Awl Hafts.
Sewing Brass Ferrule .... $3.50 ₱ gross—dis 40&10 %
" " .... 3.50 " dis 40&10 %
Patent Sewing, Short .... $1.00 ₱ doz—dis 40&10 %
" " Long .... $1.40 ₱ doz—dis 10 %
Patent Peg Plain Top .... $10.00 ₱ gross—dis 40&10 %
" " Leather Top .... 12.00 " dis 40&10 %
Awls, Brad Sets, &c.
Awls, Sewing, Common .... ₱ gross $1.70—dis 25&10 %
" Shouldered Peg .... ₱ gross 2.45—dis 25&10 %
" Patent Peg .... ₱ gross .63—dis 25&10 %
Shouldered Brad .... ₱ gross $2.70—dis 25&10 %
" Handled Brad .... $7.00 ₱ gross—dis 20&10 %
" Handled Scratch .... $7.00 ₱ gross—dis 20&10 %
" Socket Scratch .... $1.00@$1.25 ₱ doz—net
Brad Sets, Aiken's .... ₱ doz $17.00—dis 45&10 %
" No. 42, $10.50; No. 43, $12.50 .... dis 70 %
" Stanley's Excelsior, No. 1, $9.00 ... dis 30&10 %
" " No. 2, 4.80 ... dis 30&10 %
" " No. 3, 7.80 ... dis 30&10 %
Axes.
Single Bit, 4½ to 5½ and under .... ₱ doz $11.00 net
" 4½ to 6 and over .... ₱ doz $11.50 net
" Beveled .... 50 c ₱ doz advance
Double Bit, 4½ to 5½ and under .... ₱ doz $22.00 net
" 4½ to 6 and over .... ₱ doz $23.00 net
" Beveled .... $1.00 ₱ doz advance
Axle Grease.—Fraser's .... ₱ ℔ 6c
Bag Holders.
Sprengle's Patent, per doz. $18 .... dis 40 %
Balances.
All Spring Balances .... dis 15&10 %
Bells.
Hand, Light Brass .... dis. 60&10 %
" Extra Heavy .... dis 45 %
" White Metal .... dis 60 %
" Silver Chime .... dis 20&10 %
" Globe (Cone's Patent) .... dis 25&10 %
Gong, Abbe's .... dis 20&10 %
" Yankee .... dis 30&10 %
" Barton's .... dis 30&10 %
Crank Taylor's .... dis 25&10 %
" Brook's .... dis 50&10&2 %
" Cone's .... dis 10 %
" Connel's .... dis 35 %
Lever, Sargent's .... dis 60&10 %
" Taylor's Bronze or Plated Lever .... net
" " Japanned Lever .... dis 25&10 %
" R. & E. M. Co.'s .... dis 50&10&2 %
Pull, Brook's .... dis 50&10&2 %
" Western .... dis 25&10 %
Call .... dis 25 %
Cow, Common Wrought .... dis 55 & 10 %
" Western .... dis 20&10 %
" " Sargent's new list .... dis 55&10 %
" Kentucky "Star" .... dis 20&10 %
" " Sargent's new list .... dis 55&10 %
" Dodge's Genuine Kentucky, new list—
Nos. 0 1 1½ 2 3 4 5 6 Hog } dis 50 %
$12.00 10.00 9.00 8.00 6.00 5.00 3.50 2.50 5.00
Texas .... dis 50&10
Bellows.
Blacksmiths', Common .... dis 45 %
" Extra and Pittsburgh Pattern ... dis 45 %
Moulders' .... dis 25 %
Hand Bellows .... List of Dec. 1, 1870, net
Belting. Rubber.
N. Y. Belting and Packing Co .... dis. 20@50 %
Bit Holders.
Extension, Barber's .... ₱ doz $15.00—dis 40&5 %
" Ives' .... ₱ doz $15.00—dis 40 %
Diagonal .... ₱ doz $24.00—dis 40 %
Angular .... ₱ doz $24.00—dis 40 %
Blind Adjusters.—Domestic ... ₱ doz $3.00, dis 15 %
Blind Fasteners.
Mackrell's .... per doz. pairs, $1.00, dis 10%
Van Sand's .... No. 2000, per gross. $10.10 ... dis 10 %
" old pattern .... ₱ gross. $9.00 net
Washburn's Patent .... ₱ gross $11.50 net
Merriman's .... new list net
Mackrell's .... ₱ doz. pairs, $0.65, dis. 10 %
Blind Staples.
Barbed, ⅝ in. and larger .... ₱ ℔ 11c net
" ⅜ in .... ₱ ℔ 13c net
Blocks.
Differential Pulley Blocks .... dis 20 %
Penfield Block Works, Rope and Iron Strap'd ... dis 40 %
" " " Wrot. Iron Com. bushed. dis 25 %
" " " " all steel roll'r. dis 10 %
" " " Sheaves " dis 25 %
Stanley R. & L. Co., Rope and Iron Strap'd ... dis 40&10 %
Bolts.
Cast Iron Barrel, Shutter, &c .... dis 55&10 %
Cast Iron Chain (Sargent's list) .... dis 70&10 %
Bush's Lever and Chain Bolts .... dis 40 %
Ives' Pat. Door Bolts .... dis 50 %
Wrought Barrel .... dis 60&10 %
" Square .... dis 60&10 %
" Shutter, all Iron, Stanley's list ... dis 50&10 %
" " Brass Knob. " " ... dis 20&10 %
" " Sargent's list .... dis 60&10 %
" Sunk Flush, Sargent's .... dis 75&10 %
" " Stanley's .... dis 40&7½ %
" B. K. Flush, Com'n. Stanley's .... dis 50&5 %
" " Ex. Heavy .... dis 40&10 %
" Plated Knob & Slide Flush .... dis 50&2½ %
Carriage and Tire, Common .... dis 75&10 %
" " Philadelphia, new list .... dis 55 %
" " Philada. Pattern .... dis 70 %
" " Shelton's .... (old list) dis 60&10 %
R. B. & W. Carriage (old list) .... dis 65 %
Tire. Am. Screw Co.'s, Phila, new list, Nov 1, '79. dis 70&10 %
" "Bay State" .... dis 60&5 %
" R. B. & W., new list .... dis
Stove—American Screw Co.'s .... dis 40 %
" R. B. & W .... dis 40
Plow .... dis 45 %
" R. B. & W .... dis 40 %
Machine .... dis 60&10 %
Bolt Ends .... dis 60&10 %
Borax .... 17c ₱ ℔ net
Boring Machines. Upright. Angular.
First quality, no Augers ... $5.50 $5.75 ... dis 40 %
Phillips' with Augers .... 6.50 7.00 net
Boxes.
Interchangeable Shelf Boxes .... dis 20 %
Braces.
G. S. Backus .... dis 50 %
Wilson Mfg. Co .... dis 10 %
Barber's .... dis 40 %
Spofford's Patent .... dis 50&5 %
Noble's Patent .... dis 40&5 %
Ives' Patent Braces .... dis 50&10 %
Common Ball (American) .... dis 50&5 %
Amidon's .... dis 50 %
Barker's Impd .... dis 40 %
Empire .... dis 30 %
Buffalo Ball .... dis 40 %
Brackets.—Shelf (Sargent's) .... dis 60&10 %
Reading .... dis 60&10 %
Bright Wire Goods list of Dec. 15, 1879. dis 60&10 %
Bull Rings.—Union Nut Co .... dis 50&20
Sargent's .... dis 66⅔&10 %
Hotchkiss' .... low list dis 25 %
Humason, Beckley & Co.'s .... dis 60&5 %

Butts.
Wrought Brass .... dis 45&10 %
Brass, Tiebout's .... dis 30 %
" Corbin's .... dis 40&10 %
Fast Joint, Narrow .... dis 45&10 %
" Broad .... dis 45&10 %
Loose Joint .... dis 55&10 %
" Japanned .... dis 55&10 %
" with Acorns .... dis 45&10 %
" Japanned, with acorns .... dis 55&10 %
Parliament Butts .... dis 60&10 %
Mayer's Hinges .... dis 60&10 %
Loose Pin, no Acorn .... dis 50&10 %
" Acorns .... dis 55&10 %
" " Japanned .... dis 60&10 %
" " " Plated Tips ... dis 60&10 %
WROUGHT IRON.
Fast Joint Narrow .... dis 50&10 %
" Lt. Narrow .... dis 50&10 %
" Broad .... dis 50&10 %
Loose Joint, Broad .... dis 55&10 %
Table Butts, Back Flaps, &c .... dis 50&10 %
Inside Blind, Regular .... dis 50&10 %
" " Light .... dis 50&10 %
Loose Pin, Wrt .... dis 55&10 %
" " " Light .... dis 50&10 %
Spring Hinges:
American Spiral Spring Butt Co., Jap'd ... dis 25 %
" " " " Fancy ... dis 20 %
Gem Spiral Spring Butts, Japanned .... dis 25 %
" " " " Ornamental ... dis 20 %
Geer's Spring and Blank Butts .... dis 25 %
Sabin Mfg. Co.'s Double Acting .... dis 35 %
Union Spiral Spring, Japanned .... dis 25 %
" " Ornamental .... dis 20 %
Union Spring Hinge Co.'s .... dis 25 %
American Spring Hinge Co.'s .... dis 25 %
Union Mfg. Co .... dis 25 %
Bommer's .... dis 25 %
Blind Butts, Parker .... dis 75 %
" Palmer .... dis 45&10 %
" Seymour .... dis 60&10 %
" Shepard's "Double Locking" Nos. 1 & 2 .... dis 60&10&10 %
" Shepard's "Noiseless," Nos. 50 & 60 .... dis 60&10&10 %
" Lull & Porter .... dis 66⅔&10 %
" Nicholson .... dis 45&10 %
" Huffer .... dis 50 %
" Clark's, Nos. 1, 3, 5 .... dis 75 %
" Sargent's No. 12 .... dis 75&10&10 %
Bow Pins.
Hotchkiss' .... low list net
Humason, Beckley & Co.'s .... dis 60 %
Sargent & Co's .... $19.70 and $21.40, dis 60&10 %
Butchers' Cleavers.
Humason & Beckley Mfg. Co .... dis 20 %
Bradley's .... dis 25 %
Beatty's .... dis 25&5 %
1 2 3 4 5 6 7 8
$16.50 19.00 21.50 24.00 27.00 30.00 33.50 36.50
Can Openers.
Messenger's Comet .... ₱ doz $3.00, dis 25 %
American .... ₱ gross $7.50, dis 10 %
Duplex .... ₱ doz 25c. dis 15@20 %
Lyman's .... ₱ doz $3.75, dis 20 %
No 4, French .... ₱ doz $2.25, dis 55 %
No. 5, Iron Handle .... ₱ gross $7.50 dis 10 %
Eureka .... ₱ doz $2.50, dis 10 %
Sardine Scissors .... ₱ doz $7.00, dis 55 %
Star .... ₱ doz $5.00, dis 20&25 %
Sprague .... dis 60@10 %
"Worlds Best" per gross, No. 1, $12; No. 2, $24; No. 3, $36 .... dis 50 %
Caps—Percussion, ₱ 1000.
U. M. C., F. C. trimmed .... 50c } dis
" F. L. ground .... 70c } 10&5 %
U. M. C. Cen. fire ground .... 70c } dis
" Double W. proof .... $1.40 } 10&5 %
G. D. & S. B. .... 36c, dis 7½ %
Double Waterproof, in 1-10's .... $1.40 } dis
Colt's Pistol, " .... 70c } 10&5 %
F. L. .... 50c } dis 10%
E. B. 1-10, Trimmed .... 65c }
E. B. 1-10 Ground Edge .... 70c } 5 %
Musket, in 1-10's .... 75c net
Cartridges.—Rim .... dis 60&10 %
Central Fire .... dis 20 %
Cards.—Horse and Curry .... dis 10 %
Cotton .... dis 10 %
Wool .... dis 10 %
Carpet Stretchers.
Cast Steel, Polished .... ₱ doz $5.00, dis 30 %
" Iron Steel Points .... ₱ doz $2.00, dis 45 %
Bullard's .... dis 25 %
Casters.
Bed .... new list July, '80, dis 35&10 %
Plate and Shallow Socket " " dis 35&10 %
Deep Socket .... " " dis 25&10 %
Cattle Leaders.
Humason, Beckley & Co.'s .... dis 60&10 %
Sargent's .... dis 66⅔&10 %
Chain.
Trace, 6½-1-2 .... ₱ pair 79c }
" 6½-10-3 .... ₱ pair 70c } dis 40 %
" 7-10-2 .... ₱ pair 86c }
German Halter Chain, New list Oct. 22, '79 .... dis 50 %
" Coil, New list Oct. 22, '79 .... dis 50 %
Covert Halter, Hitching and Breast .... dis 35%
Oneida Halter Chain (old list) .... dis 40 %
Galvanized Pump Chain .... ₱ ℔ 10c net
Jack Chain, Iron .... dis 50 %
" Brass .... dis 40 %
Chalk.
White .... ₱ gross 60c net
Red .... ₱ gross 80c net
Blue .... ₱ gross 100c net
White Crayons .... ₱ gross 19c net
Chisels.
Socket Framing, Crossman .... dis 65&5 %
" " Arlington Edge Tool Co ... dis 65&10 %
" " Buck Bros .... new list, dis 22½ %
" " Merrill .... dis 65&10 %
" " Witherby Tool Co .... dis 65&10 %
" " Douglass' .... dis 65&10 %
" Firmers Crossman .... dis 65&5 %
" " Arlington Edge Tool Co ... dis 65&10 %
" " Buck Bros .... new list. dis 22½ %
" " Merrill .... dis 65&10 %
" " Witherby Tool Co .... dis 65&10 %
" " Douglass' .... dis 65&10 %
" Corner .... dis 65&10 %
Tanged Firmers extra .... dis 33⅓ @ 40 %
" Butcher's .... $5.00 @ 5.25 to £
" Spear & Jackson's .... 5.00 to £
" Buck Bros. (Shank) .... 5.25 to £
Clamps.
Iron, Providence Tool Co.'s, Wrt. Iron .... dis 25 %
" Adjustable, Gray's .... dis 20 %
" " Lambert's .... dis 20 %
" " Snow's .... dis 40&5 %
" " Hammer's .... dis 15 %
" " Stearns' .... dis 15&10 %
" Cabinet, Sargent's .... dis 70&10 %
" Carriage Makers', Sargent's .... dis 65&10 %
" Cord and Tape (T. & S. Mfg. Co.) .... dis 30 %
Clips, Axle.
Norway or Best .... dis 40&10%
Superior .... dis 45&10 %
Coal Hods.
Griffiths .... dis 33⅓ %
Cockeyes .... dis 35&10 %
Cocks, Brass.
Racking .... new list, July 10, '80 }
Globe .... " " }
Plain Bibbs .... " " } ... dis 40 %
Ale and Beer .... " " }
Coffee Mills.
Board and Box .... dis 35&10 %
Selsor's Pat .... $9.50, $10.50, dis 25 %
American (Enterprise Mfg. Co.) .... dis 25 %
French Steel .... dis 25 %
Combined Dinner Pail and Lantern.
Per doz $14.00 .... dis 30 %
Compasses, Dividers, &c.
Compasses .... dis 55 %
Calipers .... dis 55 %
Dividers .... dis 55 %
Bemis & Call Co.'s Dividers .... dis 60&5 %
" " Compasses & Calipers ... dis 50&5 %
" " Wing & Inside or Outside. dis 50&5 %
" " Double .... dis 60 %
" " Call's Pat. Inside .... dis 30 %
Cook's .... dis 25 %
Excelsior .... dis 50 %
Miller's Patent .... dis 25 %
Coopers' Tools.
Bradley's .... dis 15 @ 20 %
Corkscrews.—Humason & B .... dis 33⅓ %
Clough's Wire .... dis 25 %
Corn Knives and Cutters.—Bradley's .. dis 10 %
Wadsworth's .... dis 33⅓ %
Crow Bars.
Cast Steel .... ₱ ℔ 8¾c
Iron, Steel Points .... ₱ ℔ 6¾c
Curling Irons, &c.
⅜, ⅝, ¾ in., $1.80 2.00, 2.40 .... dis 10 %
Curling Tongs .... ₱ doz $3.65, dis 10 %
Pinching Irons .... ₱ doz 7.50, dis 20 %
Curry Combs.
Fitch's new list .... dis 45 @ 50 %
Hotchkiss' Novelty .... new list, July, 1880, dis 25 %
" Exclr. Supr. Champion .... dis 25 %
Lawrence .... new list, July 1880 dis 25 %
Lawrence, with detachable Mane Comb new list July 1880, dis 25 %
Rubber .... ₱ doz $10.00, dis 15 %
Curtain Pins.—Silvered Glass .... net
White Enamel .... net

Cutlery.
Meriden Cutlery Co. (Table) .... net
Am. Miller Bro.'s Cutlery Co .... dis 25 %
Humason & Beckley, Pocket .... dis 33⅓ %
The Wm. Rogers Mfg. Co .... net
Naugatuck Cutlery Co .... list net
Aaron Burkinshaw's Pocket .... dis 25 %
Dog Collars.
Embossed Gilt .... dis 20 %
Leather .... dis 30 %
Brass .... dis 25 %
Door Springs.
Torrey's Rod .... ₱ doz $2.10, dis 10 %
Gray's " .... ₱ doz $1.70, net
Bee Rod .... ₱ doz $1.70, net
Warner's .... dis 15&10 %
Gem (Coil)—
No. 1, Large, Japanned .... ₱ doz $3.50 }
No. 2, Medium, " .... ₱ doz 2.50 } dis 25&10 %
No. 3, Small, " .... ₱ doz 2.00 }
Challenge (Coil)— Nos. 9 7 6
Japanned .... ₱ doz $2.00 2.50 3.50 }
Coppered .... ₱ doz 4.00 4.50 5.00 } dis 10 %
Galvanized .... ₱ doz 3.50 4.00 4.50 }
Nickeled .... ₱ doz 5.50 6.00 7.00 }
Star (Coil)—For Cop'd, Nickel-Plated, &c. see list.
No. 4, ("Shoo Fly") Screen door size ₱ doz $1.80
No. 5, Screen Door Size .... ₱ doz $2.00 } dis
No. 6, Medium .... ₱ doz 2.50 } 30&10 %
No. 7, Large .... ₱ doz 3.50 }
Sabin's Lever. No. 1, $1; 2, $1.50; 3, $2; 4, $2.50; dis 30 %
Sabin's Boss ... No. 1, $5.40; 2, $4.20; 3, $3.00, dis 50 %
Sabin's Crown .... ₱ doz $2.75, dis 50 %
Philadelphia .... 5 in., $5.00; 8 in., $7.00, dis 35 %
Barker's Concealed .... dis 20 %
Cowell's ... No. 1, $18.00; No. 2, $15.00 ₱ doz, dis 50 %
Rubber, complete .... ₱ doz $1.80, dis 10 %
Hercules .... dis 40 %
Drawing Knives.
Arlington Edge Tool Co .... dis 65&10 %
Crossman's No. 1 .... dis 65&5 %
Merrill .... dis 65&10 %
Nobles Mfg. Co .... dis 15 %
Bradley's .... dis 35 %
Adjustable Handle .... dis 20 %
Witherby Tool Co .... dis 65&10 %
Douglass .... dis 65&10 %
Drills and Drill Stocks.
Blacksmiths' .... each $2.70 net
Blacksmiths Self Feeding .... each $7.50, dis 20 %
Breast P. S & W .... dis 20&10 %
" Hotchkiss .... dis 20 %
Breast, Wilson's .... dis 20 %
" Miller's Falls .... each $3.00, dis 25 %
" Bartholomew's .... each, $2.50 dis 25&10 %
Ratchet, Merrill's .... dis 10 %
" Ingersoll's .... dis 25 %
" Whitney's .... dis 20 %
" Weston's .... dis 20 %
" Moore's Triple Action .... dis 20 @ 25 %
Whitney's Hand Drill .... dis 50 %
Wilson's Drill Stocks .... dis 10 %
Automatic Boring Tools .... each $2.25, dis 20 %
Drill Chucks.—Morse's Beach Patent ... dis 30 %
" Adjust. each $10.00, dis 10 %
Danbury .... $8.00, dis 30 %
Egg Beaters.
Dover .... ₱ doz. $2.50 net
Acme .... $20 per gross, dis 33⅓&10 %
Standard .... $24 per gross, dis 33⅓ %
National .... ₱ doz $4.50, dis 33⅓ %
Family .... per gross $15; per doz., $1.50 net
Elevator Buckets.
Mill E. Buckets, light, 3½ to 10 in. (Duc's Improved) ₱ 100 $15.00 @ $54.00, dis. 10 %
Mill E. Buckets, heavy, 5 to 10 inches (Duc's Improved) ₱ doz $5.60 @ $10.20 dis. 10 %
Storehouse, Duc's Pat.) 12 to 17, $12.00 @ $20.00, dis. 10 %
Emery and Emery Paper.
Genuine Chester—Regular Nos .... ₱ ℔
" " Flour and FF .... ₱ ℔
" " in 10-lb. cans .... 2c extra
Washington Mills—Regular Nos .... ₱ ℔ 8c
" Flour .... ₱ ℔ 5c
Excelsior Mills, Regular Nos., Grain in kegs ... ₱ ℔ 6c
" " Flour and FF " ... ₱ ℔ 4c
" " 10-lb. cans .... ₱ ℔ 9c
Wellington Mills, Grain .... ₱ ℔ 10c net
" " Flour .... ₱ ℔ 8c net
Hampden Emery Grain .... 5c net
" " Flour .... 3c net
B. & A. Emery Paper .... dis 20&25 %
Sibley's Emery and Crocus Cloth.
Large size, $16; Medium, $10.50 per ream; dis 15 %
Enameled and Tinned Ware.
Kettles .... 45 %
Sauce Pans .... dis 30 %
Tinned Sauce Pans .... dis 30 %
Escutcheon Pins.
Iron .... dis 20 %
Brass .... dis 45 %
Escutcheons.
Door Lock .... Same discounts as Door Locks
Brass Thread .... dis 55 %
Wood .... dis 25 %
Faucets.
Fenn's .... dis 40 %
Fenn's Cork Stops .... dis 33⅓ %
Star .... dis 55&10 %
Frary's Patent Petroleum .... dis 20&10 %
Wood and Metallic .... dis 40 %
West's Patent Key .... dis 45 %
Metallic Key, Leather Lined .... dis 50 %
Cork Lined .... dis 70 %
Enterprise (Self Measuring) .... ₱ doz, $36.00, dis 25 %
Felloe Plates .... ₱ ℔ 10c, dis 10 %
Files.
Auburn .... $5.00 to £, dis 35 %
E. M. Boynton's .... new list, dis 25 %
J. & Riley Carr .... 4.50 to £
Johnson & Bro .... dis 30 %
Butcher's .... 4.50 to £
Walter Spencer & Co.'s "Diamond" .... 4.50 to £
Fisher's .... 4.75 to £
Moss & Gamble .... 4.50 to £
H. Disston & Sons (new list) .... dis 40 %
Heller Bros.' Horse Rasps .... dis 25 %
Fluting Machines.
Knox, 4-inch Rolls .... $3.25 each }
" 6 " " .... 4.00 " } dis 20 %
" 8 " " .... 6.50 " }
Peerless, 4-inch Rolls .... 4.00 each net
" 5 " " .... 4.75 each net
Eagle, 3½-inch Roll .... $2.15, dis 20 %
" 4½ " " .... $2.85, dis 20 %
Eureka, No. 1, 7-inch Roll .... 6.00 each, dis 10 %
" No. 2 4-inch Roll .... 4.00 each, dis 10 %
Crown .. 4½-in. $3.50; 6-in., $4.00; 8-in. $6.50 each dis 20 %
Star .... 4½ in., $4.00; 6 in., $5.00 each dis 10 %
Crown Jewel .... 6 in., $3.40 each. dis 20 %
American, 5 in., $3; 6 in., $3.40; 7 in., $4.50 each, dis 20 %
Domestic Fluter .... 1.50 each net
Geneva Hand Fluter, White Metal .. ₱ doz $12, dis 25 %
Crown Hand Fluter, Nos. 1, $15.00; 2, $12.50; 3, $10.00 ₱ doz .... dis 20 %
Shepard Hand Fluter .... No. 75 ₱ doz $15, dis 10 %
" " " No. 90, $9.00; No. 110, $7.25;
" " " No. 100, $6.00 ₱ doz .... net
Clark's Hand Fluter .... ₱ doz $15.00, dis 20 %
Combined Fluter and Sad Iron ... ₱ doz 15.00, dis 30 %
Buffalo .... ₱ doz 10.00, dis 25 %
Fluting Scissors .... dis 45 %
Fly Traps.
Paragon .... per doz, $3; net
Forks.
Hay, Manure and Spading .... dis 50 %
Plated "A 1, Rogers & Bro .... dis 40&5&5 %
" Reed & Barton .... dis 40&5&5 %
Fruit and Jelly Presses.
Enterprise Mfg. Co .... dis 25 %
American .... dis 20 %
Fry Pans.
Burnished, list as follows .... dis 60 %
No 0 1 2 3 4 5 6 7 8
₱ doz ... $3.00 $3.75 4.25 4.75 5.25 6.00 7.00 8.00 9.00
"Acme" .... dis 45 %
Gauges.
Marking, Stanley's .... dis 50&10 %
" Chapin's .... dis 50&10 %
Wire .... dis 10&10 %
" Disston's .... dis 20 %
Gimlets.
Nail and Spike .... dis 45 %
"Bee" Gimlets .... ₱ gross $12.00 dis 50&10 %
"Eureka Gimlets .... dis 50 %
"Diamond Gimlets .... dis 40 %
Double Cut, Shepardson's .... dis 40 %
" " Hartwell's .... dis 50 %
" " Ives' .... dis 50 %
" " Douglass' .... dis 40%
Glue Pots.
Tinned and Enameled .... dis 25 %
Family, Howe's "Eureka" .... dis 40 %
" L. F. & C.'s "Handy .... dis 25 %
Grindstone Fixtures.
Sargent's Patent .... dis 70&10&10 %
Reading Hardware Co., new list .... dis 50&10 %
Gun Wads.
U. M. C. B. E. 11 up .... $2.00 }
" " 9 & 10 .... 2.30 }
" " 7 & 8 .... 2.50 } dis 5&5 %
" P. E. 11 up .... 3.50 }
" " 9 & 11 .... 4.00 }
" " 7 & .... 4.90 }
Halters.
Covert's Pat. Rope .... dis 20 %
Horse and Cattle Ties, Covert's .... dis 50 %

Hammers.
Maydole's .... dis 15 %
Cheney's .... dis 25 %
Hartford Hammer Co. (new list July 20, '80) .. dis 20 %
Humason & Beckley .... dis 50 %
Verree .... dis 5 %
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 and 1.75, dis 25&10 %
Warner & Noble's .... dis 10 %
Kip's .... dis 20 %
Yerkes & Plumb .... dis 15 %
Wilkinson's Smiths' .... 11½c ₱ ℔ net
Hand Cuffs and Leg Irons.
Providence Tool Co.'s Hand Cuffs, $15.00 ₱ doz } dis 10 %
" " Leg Irons, $25 ₱ doz }
Tower's .... dis 25 %
Handles.—Door or Thumb Latches—
Nos ... 0 1 2 3 4
Per doz ... $0.80 1.00 1.18 1.35 1.50 ... dis 60&10 %
Roggin's Latches .... per doz 35c@40c net
Bronzed Iron Drop Latches .. ₱ doz $0.75 @ 0.85 dis 10 %
Jap'd Store Door Handles—Nuts. $1.62; Plate $1.08 no Plate, $0.87 .... dis 10 %
Barn Door .... per doz $1.40, dis 10 %
Wrought Chest .... dis 65&10 %
Surface Chest .... dis 55&5&10 %
Flush Chest .... dis 60&10&10 %
Lifting .... dis 60&10 %
Saw and Plane .... dis 40&10 %
Boynton's Pat. Loop Saw Handles .... dis 25 %
" " Centennial Saw Handles .... dis 25 %
Hammer and Hatchet .... dis 20 %
Brad Awl .... ₱ gross $2.00, dis 20&10 %
Hickory Firmer Chisel, assorted, ₱ gross $4.50 }
" " " large, " 5.00 }
Apple " " assorted, " 5.00 }
" " " large, " 6.00 } dis
Socket " " assorted, " 3.00 } 20&10
" Framing " assorted, " 5.00 }
File, assorted, ₱ gross .... 2.75 }
Auger, assorted, ₱ gross .... 6.00 }
" large, " .... 7.00 }
Patent Auger, Ives' .... dis 25
" Douglass' .... ₱ set $1.25, net
" Swan's .... ₱ set $1, net
Hangers.
Barn Door, old patterns .... dis 55&10 %
" New England .... dis 65&10 %
Novelty .... dis 40 %
Challenge .... dis 50 %
Climax (Anti-Friction) .... dis 50 %
Sterling Improved (Anti-Friction) .... dis 60&10 %
Cheritree .... dis 50 %
Kidder's .... dis 40 %
U. S .... 4 in., $12; 5 in., $15; dis 60 %
The "Boss" .... dis. 50&10 %
Harness Snaps.
Henshaw's ... List of 1½ changed to 14 00, dis 55 @ 60 %
Judd's .... " " 14.00, dis 55 @ 60 %
Fitch's (Bristol) " " 14.00, dis 55 @ 60 %
Hotchkiss' .... dis 10 %
Andrews' .... dis 50 %
Sargent's .... dis 65&10 %
"German .... dis 75 %
Covert .... dis 40 %
Covered Spring .... dis 45&10 %
Hatchets.
Isaiah Blood .... dis 15
Shingling, Nos. 1 2 3 .... ₱ doz $7.25 $8.00 $8.75
Claw, Nos. 1 2 3 .... ₱ doz 7.75 8.50 9.25
Lathing, Nos. 1 2 3 .... ₱ doz 7.50 8.00 8.50
Hunt's .... dis 25 %
Shingling, Nos. 1 2 3 .... ₱ doz $7.25 $8.00 $8.75
Claw, Nos. 1 2 3 .... ₱ doz 7.75 8.50 9.25
Lathing, Nos. 1 2 3 .... ₱ doz 7.50 8.25 9.00
Hurd's .... dis 35 @ 40 %
Shingling, Nos. 1 2 3 .... ₱ doz $8.00 $8.50 $9.00
Claw, Nos. 1 2 3 .... ₱ doz 9.00 9.50 10.00
Lathing, Nos. 1 2 3 .... ₱ doz 8.00 8.50 9.00
Yerkes & Plumb .... dis 30 %
Shingling, Nos. 1 2 3 .... ₱ doz $7.50 $8.00 $8.50
Claw, Nos. 1 2 3 .... ₱ doz 8.25 8.75 9.25
Lathing Nos. 1 2 3 .... ₱ doz 7.50 8.00 8.50
Simmons's .... dis 20
Shingling, Nos. 0 1 2 3 ... ₱ doz $7.50 $8.00 $8.50 $9.00
Claw, Nos. 1 2 3 ... ₱ doz 9.00 9.50 10.00
Lathing, Nos. 1 2 3 ... ₱ doz 8.00 8.50 9.00
Broad, Nos. 1 2 3 4 ... ₱ doz 9.00 10.00 12.00 14.00
" Nos. 5 6 7 8 ... ₱ doz 16.00 18.00 20.00 22.00
Collins .... dis 10
Shingling, Nos. 1 2 3 .... ₱ doz $6.00 $6.50 $7.00
Claw Nos. 1 2 3 .... ₱ doz 6.50 7.00 7.50
Lathing, Nos. 1 2 3 .... ₱ doz 6.00 6.50 7.00
Hay Knives.
"Lightning" .... ₱ doz $20.00 net
Wadsworth's .... dis 33⅓ %
Hinges.
Gate, Western .... ₱ doz $6.25, dis 60&10 %
" N. E .... ₱ doz $10.13, dis 65 %
" N. E. Reversible .... ₱ doz $6.50, dis 60 %
Gate, Clark's No. 1 .... ₱ doz $0.00, dis 60 %
" N. Y. State .... ₱ doz $0.50, dis 60 %
" Automatic .... ₱ doz $12.50 dis 40 %
" Common Sense .... dis 20&10 %
" Seymour's .... dis 40&10 %
" Shepard's .... Nos. 10, 20 & 25, dis 60 %
Rolled Blind Hinges .... dis 60&10&10 %
Rolled Plate .... dis 60&10&10 %
Rolled Raised .... dis 60&10&10 %
Plate Hinges "Providence" { 8, 10 & 12 in. $5.55 ₱ 100 ℔; over 12 in. $4.25 ₱ 100 ℔ } dis 10 %
Screw Hook and Strap { 8, 10, 12 in., $5.75 ₱ 100 ℔; 14 to 36 in., $4.25 ₱ 100 ℔ } dis 10 %
Heavy Welded Hook { 8 to 12 in., $5.55 ₱ 100 ℔; 14 in. & up, 4.25 ₱ 100 ℔ } dis 10 %
Screw Hook and Eye ... { ¼ & 1 in. 9c; ⅜ in. 9c; ½ in. 10c; ⅝ in. 12c } dis 20 %
Wrought Strap and T. list Dec. 20, '77 ... dis 60&10 %
Hoes.—Riveted Shank .... per doz, $5.00; dis 35 %
Socket .... ₱ doz $5.25, dis 35 %
Grub .... dis 15 %
Planters .... dis 35 %
Scovill Pattern .... dis 20&10 %
Scovill Pattern, Handled .... dis 25 %
Hick's Pat. Solid C. S. Planters' .... dis 20&10 @ 30 %
" " " Scovill Pattern dis 20&5 @ 35 %
Winsted & Lane, Planters .... dis 25 %
" " Scovill Pattern .... dis 20@25 %
Magic .... per doz, $5; net
Hooks.
Bird Cage, Sargent's list .... dis 60&10 %
" Reading .... dis 40&10 %
Cotton .... per doz. $4, dis 50 %
Cotton, Patented (N. Y. Mallet & Handle Wks), dis 30%
Cotton (Humason & Beckley Mfg. Co.) .... dis 40 %
Belt .... dis 60&10 %
Bench—Hotchkiss', $5 00 ₱ doz .... dis 10 %
" Weston's, No. 1, $10.00; No. 2, $9.00 ₱ doz dis 25 %
" McGill's, $3.00 ₱ doz .... dis 10 %
" Skinner's, $6.25 per doz .... dis 20 %
Clothes Line Sargent's list .... dis 66⅔&10 %
" " Reading list .... dis 40&10 %
Ceiling .. } Sargent's list .... dis 60&10 %
Harness. } Reading list .... dis 40&10 %
Coat and Hat, Sargent's list .... dis 60&10&10 %
" " Reading .... dis 40&10&10 %
Picture Hooks, Brown's Pat. Solid Brass, $4 per gross .... dis 25 %
Tassel (T. & S. Mfg. Co.) .... dis 40 %
Wrought Staples and Hooks and Staples ... dis 75&10 %
" Staples, Stanley's list .... dis 65&10 %
Wire Screw Hooks and Eyes .... dis 60&10 %
Grass and Bush .... dis 40@45 %
Whiffletree—Patent .... dis 40 %
Hooks and Eyes—Malleable Iron .... dis 65&10 %
" Brass .... dis 65&10 %
Horse Nails.
Nos. 5 6 7 8 9 10
Ausable, ₱ ℔ ... 31c 28c 26c 25c 24c 23c ... dis 30 %
Clinton, " ... 29c 21c 20c 19c 18c ... dis 30 %
Putnam, " ... 31c 28c 26c 25c 24c 23c ... dis 10&30 %
National, " ... 25c 23c 21c 20c 19c 18c ... dis 20&10 %
Vulcan, " ... 25c 23c 22c 21c 20c ... dis 10 %
Globe, " ... 28c 25c 23c 22c 21c 20c ... dis 20 %
Horse Shoes.—Burden .... ₱ keg $4.37½
R. I. Horse Shoe Co., Perkins' Improved Light, Medium and Heavy .... ₱ keg 4.37½
Mule Shoes .... ₱ keg 5.37½
Ice Awls, Chisels, &c.
American Ice Chisel .... ₱ doz. $3.50 net
National " .... ₱ doz $0.25 dis 20 %
Novelty Ice Breakers .... ₱ doz $6.25 dis 20 %
White's Sliding Head Picks .... ₱ doz $2.50 dis 40 %
Dunlap's Ring Picks .... ₱ doz $3.00, dis 40&10 %
Wood Head Picks, Sargent's ... ₱ doz $1.60, dis 40&10 %
Iron " .... ₱ doz 1.25, dis 40&10 %
Ice Mallets Pick in Head .... ₱ doz 1.75 net
" Pick in Handle .... ₱ doz 3.00 net
Ice Axes, Small, Cast or Malleable .. ₱ doz 1.20 dis 10 %
Kitchen Ice Tongs .... ₱ doz 2.25 net
Combination Ice Tools .... ₱ doz $200 net
Kettles.
Brass, 7 to 13 inches inclusive .... ₱ ℔ 32c net
Brass larger than 13 inches .... ₱ ℔ 35c net
Enameled .... dis 45 %
Knives.
Ames' Butcher Knives .... dis 20 %
" Shoe " .... dis 15 %
" Bread " .... ₱ doz $1.50, dis 15 %
Moran's Shoe and Bread Knives .... dis 20 %
Hay and Straw— Wadsworth's .... dis 33⅓ %
Table and Pocket .... See Cutlery
Knobs.
Carriage (Jap'd Soc. ₱ gross) .... dis 60 &10%
Base—Common .... dis 30&10%
Hemacite Door Knobs .... New list, dis 35&5 %
Door, Mineral / " Por Jap'd / " " Plated / " " Por } Same discounts as Door Locks.
Furniture, Plain .... 75c gross inch, dis 10 %
" Wood Screws .... dis 20 %
Picture (T. & S. Mfg. Co.) .... dis 50&10 %
" Sargent's .... dis 60&10 %
Hemacite Picture .... dis 35 %
Shutter, Porcelain .... dis 50&10 %

Ladles.
Melting—Sargent's .... dis 50&10 %
" Reading .... dis 30&10 %
" Monroe's Patent .... ₱ doz $4.00, dis 40 %
" P. S. & W .... dis 30&10 %
Lanterns.
Tubular .... No. 0, $8.65; No. 1, $10.15 With Guards 350 extra. } net
Hurricane No. 2 .... ₱ doz $5.75, net
Peerless .... No. 5, ₱ doz $11.75, dis 10&10 %
Brady's Patent .... dis 10&10 %
Ætna .... dis 10&20 %
Yankee .... dis 10&10 %
De Beque .... dis 10&10 %
Police. Small, $7.00; Med., $8.25; Large, $12.00, dis 10 %
Convex Reflector .... $2.75 ₱ doz, dis 10 %
Lawn Mowers.
Pennsylvania, Philadelphia and Excelsior, new list .... dis 25 %
Excelsior .... dis 22½&10 %
Lemon Squeezers.
Porcelain Lined .... ₱ doz $6.00—dis 30 %
Wood .... ₱ doz $3.00—dis 30 %
Eureka, Tinned .... ₱ doz $8.00—dis 10 %
Dunlap's Improved .... ₱ doz $4.00 net
Sammis' .... No. 1, $7.00; No. 2, $12.00 ₱ doz; dis 45 %
Townsend's Patent .... $6.00 ₱ doz., dis 33⅓ %
Lines.—Linen Fish .... dis 20&10 %
Cotton Chalk .... dis 55 %
Sil. Lake Chalk ... Nos. 0, 1, 2, 3, $6.00, $6.50, $7.00, $7.50 .... dis 25 %
Mason's Linen .... dis 25&10 %
Wire Clothes, Galvanized .... each 25 @ 40c net
Locks and Latches.
Cabinet—Eagle / Gaylord / Bridgeport } Changes made in list price of some numbers Jan. 1, 1881, dis 25&2 %
" A. E. Deitz .... dis 30@40 %
Trunk, new list, Jan. 1, 1881 .... dis 20&2 %
Langstroth & Crane's List Jan. 1 '77.
Round Key, No. 1 to 5 .... dis 40&10 %
" No. 5½ to 12 .... dis 40& 10 %
Flat Key .... dis 33⅓&10 %
A. E. Deitz, Flat Key .... dis 30 %
Yale Lock Co., Flat key .... dis 40 %
"Shepardson" or "U. S." .... dis 35 %
"Felter" or "American" .... dis 33⅓ %
Plate .... dis 33⅓&2 %
F. Many's 'Extension Cylinder" ... $10.50 ₱ doz, net
DOOR LOCKS, &c
Branford / Norwalk / Norwich / P. & F. Corbin / Russell & Erwin / Mallory, Wheeler & Co. / Reading Hardware Co. / Trenton Lock Co. } List of June 10, with changes of Dec. 1, 1880. dis 45&2 %
Padlocks—Russell & Erwin / " Mallory, Wheeler & Co / " Wm. Wilcox & Co } ... dis 40 % and 2 % for cash
" Yale Lock Mfg. Co.'s "Standard" ... dis 40 %
" Romer's .... dis 30 %
" Conestoga .... dis 60 %
" J. H. McWilliams .... dis 10 %
" A. E. Dietz .... dis 25 %
Lustre.—4-oz. bottles, per doz, $2; per gro, $18; net
Mallets.—Hickory .... dis 10&10 %
" Lignumvitæ .... dis 10 %
Penfield Block Works, Lig., Apple & Hickory .. dis 30 %
Meat Cutters.
Dixon's (P. S. & W.) Nos. 1 2 3 4
₱ doz .. $14.00 17.00 19.00 30.00—dis 35 %
Miles' Challenge ... Nos. 1 2 3
₱ doz .. $22.00 30.00 40.00—dis 35 %
Perry's Nos. 1 2 3 4 4 g'rd 5 g'rd
Each ... $3.00 4.00 5.00 11.00 13.00 30.00—dis 30 %
Woodruff's (P. S. & W.) ... Nos. 100 150
₱ doz $16.00 18.00 dis 35 %
Hales' ... Nos. 11 12 13
₱ doz .. $27.00 33.00 45.00 .. dis 40&10&2 %
Draw Cut ... Nos 5 2 6 8 10
Each .. $50.00 75.00 80.00 225.00 400.00—dis 20 %
American .... dis 25 %
Nos ... 1 2 3 4 B 5
Each ... $5.00 7.00 10.00 25.00 50.00 60.00
Kieser's No. 55 .... $40 per doz., dis 40 %
" Gem .... $25 per doz., dis 40 %
Silver & Deming .... dis 25 %
Pennsylvania .... dis 40&10 %
Nos ... 1 2 3 00
₱ doz ... $24.00 28.00 36.00 28.00
Beef Shavers (Enterprise Mfg. Co.) .... dis 25 %
Mincing Knives.
Am., (2d quality) per gross, 1 blade, $7; 2 blades, $12; 3 blades, $18 .... net
Lathrop's .... dis 10&10 %
Smith's ... per doz, Single, $1.35; Double, $1.80; dis 10 %
Cowles Hdw. Co .... dis 40&10 %
Molasses Gates.
Stebbins Pattern .... dis 70&10 %
" Genuine .... dis 70&5 %
" Tinned Ends .... dis 40&10 %
Chase's Hard Metal .... dis 10&10 %
Bush's .... dis 20 %
Lincoln's Pattern .... dis 50&10 %
Weed's .... dis 15 %
Boss, No. 1 2 3 4
$7.00 $8.00 $9.00 $10.00 per doz.
" Japanned Finish .... dis 50&10 %
" Bronze " .... dis 49&10 %
Nails .... See Trade Report
Nuts and Washers.
Square Nuts .... 7¾c off list
Hexagon Nuts .... 7¾c off list
Washers .... 7½c off list
Nut Crackers.
Table (Humason & Beckley Mfg. Co.) .... dis 33⅓ %
Blake's Pattern .... ₱ doz $2.50, dis 10 %
Turner & Seymour Mfg. Co .... dis 50 %
Oakum.
Best .... ₱ ℔ 11c
U. S. Navy .... ₱ ℔ 10c
Navy .... ₱ ℔ 8½c
Oilers.—Zinc and Tin .... dis 50 %
Brass and Copper .... dis 50 %
Malleable (Hammer's) .... ₱ doz $6.00, dis 10 %
Prior's Patent or "Paragon Zinc .... dis 50 %
" " Brass .... dis 40 %
Olmstead's, Tin and Zinc .... dis 50 %
" Brass and Copper .... dis 50 %
Broughton's, Zinc .... dis 40 %
" Brass .... dis 30 %
Ox Balls .... dis 40&10 %
Pencils.
Faber's Carpenters' .... High list, dis 40&10 %
" Round Gilt .... ₱ gross $5.25 net
Dixon's Lead .... ₱ gross 4.50 net
" Lumber .... ₱ gross
Dixon's Carpenters' .... dis 40 & 10 %
Packing, Steam.
N. Y. Belting and Packing Co .... dis 20 %
Picture Nails.
Brass Head, Sargent's List .... dis 50&10 %
" T. & S. Mfg. Co .... dis 40 %
Porcelain Head, Sargent's List .... dis 50&10 %
" " Judd's List .... dis 30 %
Porcelain Head, T. & S. Mfg. Co .... dis 33⅓ %
Niles' Patent .... dis 25 %
Picks and Mattocks .... dis 35 %
Pinking Irons .... ₱ doz 75c net
Plaiting Machines.
Magic .... ₱ doz $10.00, net
Astor Plaiting Machine .... each $15.00, dis 20 %
Crown Plaiting Machines .... dis 25 %
6in. $6.00 10in., $10.00 each
Planes and Plane Irons.
Bench, First Quality .... dis 25&10 %
" Second " .... dis 30&10 %
Moulding .... dis 25&10 %
Bailey's (Stanley R. & L. Co.) new list Jan. '79. dis 20&10 %
The Stanley (S. R. & L. Co.) " " dis 20&10 %
Bailey's "Victor" .... dis 20&10 %
Defiance Adjustable .... dis 20&10 %
Lafin Mfg. Co .... dis 35 %
Plane Irons, Butcher's .... $5.40 to £
" Buck Bros .... $5.00 to £
" Auburn Tool Co.'s .... dis 20 %
" The Globe Mfg. Co. "Baldwin Iron" .... dis 20 %
" Ohio Tool Co .... dis 20 %
" Sandusky Tool Co .... dis 20 %
Pliers and Nippers.
Button's Patent .... dis 33⅓ %
Hall's Pat. Compound Lever Cutting Nippers No. 2; 6 in. $20; No. 4, 7 in., $30 ₱ doz .... dis 15 %
Humason & Beckley Mfg. Co .... dis 33⅓ %
Gas Pliers .... dis 50 %
Eureka Pliers and Nippers .... dis 25 %
Russell's Parallel .... dis 20 %
P. S. & W. Cast Steel .... dis 35 %
" Tinners' Cutting Nippers .... dis 15 %
Plumbs and Levels.
Disston's .... dis 40 %
Stanley R. & L. Co.'s Pat. Adjustable .... dis 65&10 %
" " Non-Adjustable .... dis 50&10 %
Chapin's Patent Adjustable .... dis 65&10 %
" Non-Adjustable .... dis 55&10 %
Standard Rule Co.'s New Adjustable .... dis 60&10 %
" Non-Adjustable .... dis 60&10 %
Johnson's Patent Adjustable .... dis 60&10 %
Pocket Levels .... dis 65&10 %
Davis' Inclinometers .... dis 20 %
Post Hole and Tree Augers.
Samson Post Hole Digger .... per doz $37.50, dis 20 %
Fletcher Post Hole Augers .... ₱ doz 36.00, dis 20 %
Vaughan's Post Hole—
6 in. $23.60; 7, 8 and 9 in. $25 per doz .... dis 15&10 %
Eureka Diggers ₱ doz. $40.00 .... dis 25&10 %
Pruning Hooks and Shears.
Disston's Combined Pruning Hook and Saw per doz $19.00, dis 20 %
" Pruning Hook .... " 12.50, dis 20 %
R. S Lee & Co.'s Pruner .... dis 30 %
Pruning Shears .... ₱ doz $5.50@$30.00
Pulleys.
Hot House and Tackle .... dis 60&10 %
Jap'd Screw .... dis 60&10&10 %
Brass Screw .... dis 60&10 %
Jap'd Side .... dis 60&10&10 %
" Clothes Line .... dis 60&10 %
Hay Fork Solid Eye .... $4.50; Swivel, $6.00, dis 50&10 %
" " "Anti-Friction." .... $7.50 dis 40&5 %
" " "F" Common and Pat. Bushed .... dis 20 %
" " Tarbox Pat. Iron .... dis 20 %
Shade Rack .... dis 50 %
Punches.
Belt or Drive .... ₱ doz $2.00; 2.25; 2.50, dis 50 %
Bemis & Call Co.'s Cast Steel Drive .... dis 50&5 %
" " Springfield Socket .... dis 50&5 %
Spring .... ₱ doz $9.00, dis 50&5 %
" Leach's Patent .... dis 15%
Bemis & Call Co.'s Spring and Check .... dis 40 %
Solid, Tinners' .... ₱ doz $1.44, dis 40 %

Rail.
Sliding Door Wrought Brass.....₩ ℔ 43c dis 30 %
" " Iron, Painted .₩ foot 4c. dis 10&10
Barn Door....Inch..... ½ ⅝ ¾
Per 100 feet. $2.00 3.00 5.00—dis 10 %
" for N. E. Hangers—
Small. Med. Large.
Per 100 feet .. ..$2.10 2.70 4.30—net

Razors.
J. R. Torrey Razor Co.....dis 15 %

Razor Strops.
Genuine Emerson.....dis 44@45
Badger's Emerson.....dis 40
Badger's (not Emerson).....dis 30
Evans'.....dis 30 %
Imitation Emerson.....₩ doz $2.00. dis 20 %
Hunt's.....dis 40@5 %
Chapman.....dis 15 @ 30 %
Saunder's.....dis 10 %
Torrey's.....dis 20 %

Rivets.
Iron and Tinned.....dis 65 %
In bulk, list of May 21.....dis 50 %
Copper Rivets and Burs.....dis 33⅓ %
Nos.. " 8 9 10 11 12 13 14 15
₩ ℔..40c 50c 52c 54c 56c 58c 60c 65c 70c
Burr's.....dis 50 %
Rivet Sets.....40 %

Rods.
Stair, Brass.....dis 20 %
Stair, Black Walnut.....dis 20&10 %
Stair, American Patent.....dis 20 %

Rollers.
Barn Door, Sargent's list.....dis 55&10 %
Novelty.....dis 10 %
Acme (Anti-Friction).....dis 40 %

Rope. Manufacturers' Net List. Feb 24, 1881
Manila.....¼ inch and larger ₩ ℔ 14½c
" .....⅜ inch ₩ ℔ 15 c
" .....7/16 and 1/2 inch ₩ ℔ 15½c
" Tar'd Rope.....₩ ℔ 14 c
" Lath Yarn.....₩ ℔ 14 c
" Hay Rope.....₩ ℔ 14½c
Sisal.....¼ inch and larger ₩ ℔ 13½c
" .....⅜ inch ₩ ℔ 13 c
" .....7/16 and 1/2 inch ₩ ℔ 12½c
" Hay Rope.....₩ ℔ 11½c

Rules.

	Boxwood.	Ivory.
Chapin's	dis 70&10 %	dis 60&10 %
Standard		
Stanley		

Sad Irons.
From 4 to 12 lbs.....₩ ℔ 3½c net
Self Heating.....₩ doz $19.00 net
" Tailors'.....₩ doz $18.00 net
Pleason's Shield and Toilet.....dis 25 %
Mrs. Pott's Irons, Double Pointed.....dis 35 %
Mrs. Pott's Irons, Square Back.....dis 40 %
Enterprise Star Irons.....dis 40 %
Combined Fluter and Sad Iron..per doz $10.00. dis 10 %

Sand Paper.
Baeder & Adamson's Flint, 00 to 1½...$4.75 ₩ ream
" " 2, 2½ & 3. 4.25 ₩ ream
" " Assorted 4.75 ₩ ream
" " Star..... 5.75 ₩ ream
" " Emery..₩ ream $6.50 @ 11.00
Bartles Flint, same list as B & A.....dis. 25%
" Harrison, $3.75 per ream.....dis 25%
New England, same list as B. & A. Flint.....dis 25 %
Sare's.....dis 20&10 %

Sash Cord.
Common.....₩ ℔ 14 @ 20c net
Patent.....₩ ℔ 15c net
Silver Lake Russia Flax.....₩ ℔ 6½c. dis 10 %
White Cotton.....₩ ℔ 60c. dis 10 %
Drab Cotton.....₩ ℔ 54c. dis 10 %
Raw Hide.....dis 25 %
Steel Ribbon.....dis 10 %

Sash Locks.
Clark's, No. 1, $10.00; No. 2, $8.00 per gross.....dis 33⅓%
Fercuson's.....dis 33⅓ %
Walker's.....net
Hammond's Window Springs.....dis 25 %
Northup Window Springs, No. 1, $10.00; ₩ gross.dis 15 %
The Perfect, Clark & Smith, Plain Jap'd ₩ gro $10.00 net
" " For. Knob Jap'd. ₩ gro 14.00 net
" " Nickel-Plated...₩ gro 27.00 net
"Universal".....dis 30 %

Sash Weights.—Solid Eyes, in 500 ℔ lots
and over.....₩ ℔ 1¾c net

Sausage Stuffers or Fillers.
Miles.....₩ doz $20, dis 30 %
Perry.....₩ doz, No. 15: No. 0, $21, dis 35 %
Draw Cut No. 4.....each $30.00, dis 20 %
Enterprise Mfg. Co.....dis 25 %
Silver's.....dis 25%

Saws.
Disston's Circular.....dis 4 %
" Mill.....dis 40 %
" Cross Cut.....dis 40 %
" Hand, Panel, Rip, &c.....dis 20 %
Boynton's Lightning, Cross Cuts, new list.....dis 20 %
" One-Man, all lengths, " .....dis 20 %
" Billet Webs, 30 in. " .....dis 25 %
" Lightning Buck Saws X Par.....dis 25 %
" Lightning Hand, Panel and Rip.....dis 25 %
Wheeler & Clemson Mfg. Co.'s Hand.....dis 20 %
W. M. & C. Mfg. Co. Cross-Cuts, except Monarch, dis 20 %
Livingston's Butcher and Kitchen.....dis 20 %
" Framed Wood—

Nos....	101	102	103	104	105
Per doz.	$10.00	8.40	10.00	7.40	6.2c net

Saw Frames.
White, Vermont.....₩ doz $1.35, dis 25 %
Red, Polished and Varnished.....₩doz $2.00, dis 25 %
Saw Rods.....$10 list dis. 10&10 %

Saw Sets.
Boynton's Patent X Cut, per doz. $12.00: Hand Saw, per doz., $10.00.....dis 30 %
Stillman's Genuine.....₩ doz $3.40 and $4.50 dis 10 %
" Imitation.....₩ doz $2.25. dis 10&10 %
Common Lever.....per doz $2.00. dis 30&10 %
Leach's.....No. 0, $8.00; No. 1, $15.00. dis 10 %
Nash's.....No. 1 $3.00; No. 2, $5.00. dis 20&10 %
Hammer, Hotchkiss.....$4.00. dis 10 %
" Bemis & Call Co.'s New Pat.....dis 40&10 %
Bemis & Call Co.'s Lever & Spring Hammer..dis 30&10 %
" " Plate.....dis 10 %
" " Cross Cut.....dis 12½ %
Aiken's Genuine.....$13.00. dis 40&10 %
" Imitation.....$7 00. dis 10 %
Hart's Patent Lever.....dis 20 %
Disston's.....dis 20 %

Scales.
Hatch, Counter, No. 171.....₩ doz $36. dis 35&10 %
" Ten, No. 181.....₩ doz $12.00 dis 40&10 %
Union Platform.....$6 00. dis 40 %
Fairbanks'.....dis 20 %
Buffalo Scle Co.....dis 40&5 %
Howe's.....dis 20&5 %
Chatillon's Grocers'.....dis 40 %
" Eureka.....dis 25 %
Family Universal.....dis 50 %
" Favorite.....dis 40 %
" Turnull's.....dis 40 %
Scale Beams, Chatillon's list.....dis 10 %
" Sarrent's list.....dis 50&10 %

Scrapers.
Adjustable Box Scraper (S. R. & L. Co.), $6.to.dis 20&10 %
Bent, 1 Handle.....₩ doz $4 00, dis 10 %
" 2 " .....₩ doz 6.00 dis 10 %
Defiance Box and Ship.....dis 20&10 %
Foot.....dis 15 %
Ship (common).....per doz $3.00 net
" (Providence Tool Co.....dis 10 %

Screw Drivers.
Douglass Mfg. Co.....dis 20&10&10 %
Disston's.....dis 40 %
Disston's Patent Excelsior.....dis 20 %
Buck Bros.....dis 25 %
Stanley Rule & Level Co., Varnished Hdls...dis 50&10 %
" " " Black Handles...dis 40&10 %
Sargent & Co.'s.....dis 50&10 %
Gay's Double Action Ratchet
per doz., 4 in., $9.00; 5 in., $10.80; 6 in., $12.00 dis 30 %
Cowles Hdw. Co., No. 1 Extra.....dis 40&10 %
" " No. 1.....dis 40&10 %
" " Nos. 4 and 00.....dis 30 %

Screws.
Flat H'd Iron.....dis 40 %
Round Head Iron.....dis 35 %
Flat Head Brass.....dis 40 %
Round Head Brass.....dis 30 %
brass and Silver Capped.....dis 40 %
Japanned, list of Plain Screws.....dis 30&10 %
Coach Patent Gimlet Point, List per 100.....dis 60 %
Coach, Common.....dis 60&10 %
Bed.....dis 10 %
Machine, Flat Head, Iron, Am. Screw Co.....dis 60 %
" Round Head, Iron, " .....dis 65 %
Bench, Iron.....dis 60&10 %
" Wood, Beech.....₩ doz $3.00, dis 10 %
" Hickory.....dis 20&10 %
Hand.....dis 20&10 %
Hand Rail, Sargent's.....dis 06⅔&10 %
" " Humason, Beckley & Co's.....dis 40 %
" " Am. Screw Co., list of Jan. 1, '81.dis 60&10 %
Jack (Wilson's).....dis 20 %

Screw Window Balances.
R. B. Huguain's.....$36.00 per gross, dis 25% 10&5 %

Scroll Saws.
Lester, $10.0.....dis 20 %
Rogers, $3.40.....dis 25 %

Shears and Scissors.
American (Cast) Iron.....dis 70&10 %
Clipper Cast Iron.....dis 70&10
Pruning.....see Pruning Hooks and Shears.
Barnard's Lamp Trimmers.....₩ doz $3.75
Tinners'.....dis 15 %
Seymour's, List, Nov. 25, 1879.....dis 60 %
Heinsoh's " " .....dis 60 %
" Tailors' Shears.....dis 33⅓ %
Mass. Cutlery Co. St. Trimmers.....dis 75 %

Sheaves.
Sliding Door, M. W. & Co., list.....dis 40&2 %
" R. & E. list.....dis 60&1 &2 %
" Patent Roller.....dis 10 %
" " Hatfield's...dis 60&10&2 %
" Russell's Anti-Friction ...dis 60&10&2 %
" Moore's Anti-Friction.....dis 40 %
Sliding Shutter, R. & E. list.....dis 60&10&2 %
" " Sargent's list.....dis 60&10 %
" " Reading list.....dis 55&10 %
Moore's Anti-Friction (Hanging).....dis 45 %

Shovels and Spades.
Ames, New list, Jan. 26, 1880.....dis 12½ %
Hussey Binns & Co., Patent.....dis 15 %
" " Association List.....dis 5
Old Colony.....dis 12½ %
Remington's (Lowman's Patent).....dis 25 %
Rowland's.....dis 40 %
Griffiths.....dis 40&10 %

Shovels and Tongs.
Iron and Brass Head, R. & E. list.....dis 10&2&2 %
Polished Steel.....new list. dis 40&10&2 %

Slates.
Square Frames.....by case.....dis 70 %
Less than a case.....dis 60&10 %

Spoke Shaves.
Defiance Metallic.....dis 20&10 %
Iron.....dis 45 %
Wood.....dis 30&10 %
Bailey's (Stanley R & L. Co.) new list.....dis 30&10 %
Stearns'.....dis 25&10 %

Spoke Trimmers.
Bonney's.....₩ doz $10.00 dis 40&5 %
Stearn's.....₩ doz $10.00 dis 40 %
Ives'.....No. 1, $15.00; No. 2, $12.00 ₩ doz, dis 50&10 %
Douglass'.....₩ doz $9.00. dis 15 %

Spoons.
Basting.....dis 15 %
Riveted Table and Tea.....dis 55 %
Solid Table and Tea.....dis 65 %
Britannia.....dis 70 %
The Wm. Rogers Mfg. Co.....dis 40&5&5 %
Reed & Barton.....dis 40&5&5 %
Hall & Elton.....dis 40&5&5 %
Holmes, Booth & Haydens.....dis 40&5&5 %
German Silver.....dis 30&10&5 %
Cast Steel, Sil. Plated.....dis 33⅓ %
Tin (P. S. & W.), Teas.....$1.25 ₩ gross, net
" " " Tables.....$2.00 ₩ gross, net
Tin Cowles Hdw. Co.).....dis 10 %
" " case lots.....dis 30 %

Stocks and Dies.
Stocks and Dies.....dis 5&10 %
"Lightning" Screw Plate.....dis 10 %

Stone.
Hindostan Hacker Stone.....₩ gross $12.00 dis 10 %
Sand Stone.....₩ ℔ 6c. dis 33⅓&10 %
Washita Stone.....No 1. ₩ ℔ 18c net
" " No 2. ₩ ℔ 10c net
" Slips.....No. 1, ₩ ℔ 40c net
Arkansas Stone No. 1, 4 to 6 in.....℔ ₩ $1.35 net.
" " No 1, 6 to 9 in.....℔ ₩ $2.00 net
Turkey Oil Stone (Chase).....4 to 8in, $1.00 ₩ ℔,
" Slips.....$2.50 ₩ ℔ dis 10 %
Lake Superior (Chase).....₩ ℔ 20c, dis 10&5 %
" Slips.....₩ ℔ 44c, dis 10&5 %
Grindstones. Family, Loring's.....dis 10 %

Stove Polish.
Joseph Dixon's.....₩ gross $9.00 d's 10 %
Gem.....₩ gross $4.50, dis 10 %
Gold Medal.....₩ gross $6.00, dis 25 %
"Mirror".....₩ gross $6.00, dis 5 %
Ruby.....₩ gross $3.75, net
Rising Sun.....₩ gross $4.75, net
Dixon's Plumbago.....₩ ℔ 8c. net

Squares.
Steel.....dis 50 %; full cases, dis 50&10 %
Iron.....dis 50 %; full cases, dis 50&10 %
Nickel Plated.....add $2.00 @ $4.00 ₩ doz. net
Try Squares and T Bevels.....dis 60&10
Disston's Try Square and T Bevels.....dis 40 %
Winterbottom's Try and Mitre.....dis 20&10 %

Tacks, Brads, &c.
List of April 2, 1880

Tinned Swedes Tacks	dis 40 %
Tinned American "	dis 45 %
Swedes Tacks, all kinds	dis 20 %
Copper Tacks and Nails	dis 30 %
Swedes Hungarian Nails	dis 30 %
American "	dis 30 %
Gimp and Lace Tacks	dis 30 %
Finishing Nails	dis 25 %
Trunk and Clout Nails	dis 25 %
Common and Patent Brads	dis 20 %
Basket Nails	dis 25 %
Brush Tacks	dis 20 %
Leathered Carpet Tacks	dis 20 %
American Cut Tacks	dis 25 %
Cigar Box Nails	dis 25 %
Chair Nails	dis 25 %
Double-Pointed Tacks	dis 40&5 %

Extra 10 % on all.

Tap Borers.
Common and Ring.....dis 15 %
Ives' Tap Borers.....dis 15&10 %
Enterprise Mfg. Co.....dis 25 %

Tapes. Measuring.
American.....dis 20 %
Spring Tapes.....dis 25&10 %

Thermometers.
Tin Case.....dis 70 %

Tobacco Cutters.
Enterprise Mfg. Co. (Champion).....dis 25 %
Wood Bottom.....₩ doz $12.00, dis 40&5 %
All Iron.....₩ doz $9.50. dis 40&5 %
Nashua Lock Co.'s.....₩ doz $18 00, dis 5@55 %

Toe Calks.—Winsted.....₩ ℔ 9c. dis 5

Tinners' Tools and Machines.
Machines (P. S. & W.).....list add 20 %
Tools (P. S. & W.).....add 6 %

Transom Lifters.
Wollensak's Patent.....dis35 %
Richer's Patent.....dis 20&10&10 %

Traps.
Game, Newhouse.....dis 50 %
" Oneida Pattern.....dis 50 @ 55 %
" Blake's Patent.....dis 40 %
House, Wood, Choker.....₩ doz holes, 16½c
" Round Wire.....₩ doz $1.50, dis 10 %
" Cage " .....₩ doz $4.50. dis 10 %
" Catch-em-alive.....₩ doz $2.50, dis 10 %
Rat, "Decoy".....per doz $10.00, dis 20 %

Trowels.
Lothrops Brick and Plastering.....dis 25 %
Reed's Brick and Plastering.....dis 15 %
Disston's Brick and Plastering.....dis 20 %
Peace's Plastering.....dis 30 %
Clement & Maynard's.....dis 20 %
Rose's Brick.....dis 15 %
Brades' Brick.....dis 20 %
Worrall's Brick and Plastering.....dis 20 %
Garden.....dis 55&10 %

Triers.
Butter and Cheese.....dis 20%

Vises.
Solid Box.....List. of July 1, '79 dis 30 %
" "Crown" (A. H. Hildick) 40 to 100 ℔, 15c net
" Peter Wrights.....15½c
" Wilkinson's.....13½c
Parallel, Parker's.....dis 10 %
" Wilson's.....dis 40 %
" Howard's.....dis 20&10 %
" Merrill's.....dis 15 %
" Sargent's.....dis 50&10 %
" Trenton.....dis 30 %
" Backus and Union.....dis 40 %
" Oval Slide.....dis 40 %
" Double Screw Leg.....dis 15&10 %
" Prentiss.....dis 25 %
" Simpson's Adjustable.....dis 25 %
"Family." List.....net
Saw Filers, Bonney's.....₩ doz $24.00, dis 20&10 %
" Stearn's.....dis 20&10 %
" Hopkins'.....₩ doz $17.00 dis 10 %
Reading.....dis 40&10 %
Cowell Stand Vises.....dis 20 %
Richardson's Vise and Anvil.....dis 25 %

Washer Cutters.
Smith's Patent.....₩ doz $12.00 dis 25 %
Johnson's.....₩ doz $12.00. dis 33⅓ %
Penny's.....₩ doz $14.00 and $16.00. dis 45 %
Appleton's.....₩ doz $16.00, dis 50&10 %

Washers.—See Nuts and Washers.

Well Wheels.—Revised list.....dis 60&10%

Wire.

Brass and Copper	List of June 10, 1880....dis 20 %
Bright and Annealed	Nos. 0 @ 18. dis 55 %
" "	Nos. 19 @ 26. dis 60 %
" "	Nos. 27 @ 36. dis 65 %
Coppered	Nos. 0 @ 18.dis 40 %
Galvanized, Nos. 0 to 6	₩ ℔ 10c. dis 40 %
" Nos. 7 to 12	market list. dis 40 %
Tinned Nos. 0 to 12	dis 45 %
Cast Steel	dis 30
Tinned Broom Wire, Nos. 12 to 20	dis 60 %
Annealed Fence, Nos. 8 and 9	dis 55 %
" Grade, Nos. 10 to 14	dis 55 %
Galvanized Telegraph, Nos. 7 to 9	₩ ℔ 9c
" " Nos. 10 and 11	₩ ℔ 100
" " No. 12	₩ ℔ 104c
Fence Staples	₩ ℔ 7½@ 7¾c
" Staples, Galvanized	₩ ℔ 8¼ @ 8½c
Strobs Steel Wire	$7.00 to 8
Japanned Barb Fence	₩ ℔ 9c
Galvanized "	₩ ℔ 12c
Steel Music Wire, Nos. 12 to 27	₩ ℔ $1.25 net
Turner & Seymour Mfg. Co., Picture Wire..dis 80&20 %	
Judd's Picture Wire	dis 80&20 %
Clothes Line Wire, Galvanized	₩ coil 2@40c net
Wire Cloth, green and drab	₩ sq. ft, 3 c net

Wrenches.

American Adjustable	dis 45 %
Baxter's Adjustable "S,"	list Jan., 1880. dis 10&10 %
" Diagonal	dis 15&10 %
Coes 'Genuine	dis 40 %
" "Mechanics"	dis 50&10 %
" Pattern, Malleable	dis 70&10 %
Girard Standard	dis 50&10 %
Girard Adj	60&10 %
Bemis & Call's Patent Combination	dis 20 %
" " Merrick's Pattern	dis 35 %
" " Briggs' Pattern	dis 25 %
" " Cylinder or Gas Pipe	dis 40 %
Van Waroner & Williams' Basin	per doz $4.40
Aiken Pocket (Bright)	$8.00. dis 60&10 %
The Favorite Pocket (Bright)	per doz $3, dis 60 %
Webster's Pat. Combination	dis 25 %

Wringers.

		Per doz
Universal, XX	No. 2½	$6 .00
" "	No. 2	63.00
" "	No. 1½	72.00
" "	No. 1	95.00
" "	No. 0	each, 12 00
" "	No. 12	20.00
" "	No. 18	" 25.00
" "	No. 22	" 32.00
Peerless, No. 0, no Cogs		41.00
" No. 1, "		54.00
" No. 2½, with Cogs		60.00
" No. 2, "		64.00
" No. 3, "		71.00
" No. 4, "		89.00
Unique, No. 0		51.00
" No. 1		54.00
Eureka, No. 2		54.00
Novelty, No. 10, with Cog Wheels		60.00
" No. 2, "		8 00
Excelsior, No. A, with Folding Bench		75 00
" No. E, for Set Tubs		60.00

dis 20&5 %

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Special Finest CAST STEEL WIRE,

MARKET STEEL WIRE, PRIME COPPERED SPRING WIRE, TEMPERED AND UNTEMPERED STEEL WIRES, IN LONG LENGTHS, FOR CRINOLINE, CORSET, LOCK AND BRUSH MAKERS, AND ALL SPECIAL PURPOSES.

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See Page 3.

Steel.

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Silica	4.95
Peroxide of Iron	84.60
Oxide of Manganese	1.65
Alumina	1.94
Lime	0.33
Magnesia	traces
Phosphoric Acid	0.04
Sulphuric Acid	0.42
Combined Water	5.97
Moisture	2.43
	100.43
Metallic Iron	59.98

The Sulphuric Acid exists as Sulphate of Lime, and is, in my opinion, not detrimental.

Signed, E. D. RILEY, F. C. S.

Cable address:

HENRY CARTER, *London.*

LITTLE WONDER.

and Shaped Diamond Carbon Points, indispensable for Truing Emery Wheels, Grindstones, Hardened Steel, Porcelain and Paper Calender Rollers, Drilling, Planing, Molding, Millstone Dressing, and Sawing Stone.

J. DICKINSON,

64 Nassau Street, NEW YORK.

Emery, Grindstones, &c.

Walter R. Wood,

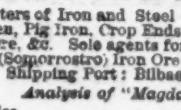
GRINDSTONES.

Berea, O., Nova Scotia, & other brands

283 and 285 Front Street, New York.

GEO. CHASE,

The largest manufacturers in the world of

OIL  **STONE**

Of all description.

107th Street and Harlem River,

Send for Illustrated Price List. NEW YORK.

LOMBARD & CO.,

Importers and Dealers in

GRINDSTONES,

Cor. Lewis Wharf & Atlantic Ave., Boston.

Stones for Machinists, Carpenters, Farmers and Glass Cutters constantly on hand and cut to order.

ASHLAND EMERY CO.

CHARLES ALDEN, MANAGER.

Importers and Manufacturers of PURE

TURKISH EMERY

A. A. IRVINE & CO., Agents,

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Send for quotations and samples.

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BEST AND CHEAPEST.

Established 1845.

Office, foot of Houston Street, East River, NEW YORK.

NEWTON & CO.,

ALBANY, N. Y., Manufacturers of

FIRE BRICK

Stove Linings,

Range and Heater Linings

Cylinder Brick, &c., &c.

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Manufacturers of

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DRAIN PIPE & LAND TILE.

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BORGNER & O'BRIEN,

Manufacturers

FIRE BRICK

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Edge Pressed Furnace Blocks,

CLAY RETORTS, TILES, &c.,

Twenty-third Street,

Above Race, *PHILADELPHIA.*

Twenty years' practical Experience.

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Clay Retort and Fire Brick Works,

(EDWARD D. WHITE & CO.)

Manufacturers of **Clay Retorts, Fire Brick, Gas House and other Tile.**

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WATSON FIRE BRICK CO.,

ESTABLISHED 1836.

ssors to JOHN R. WATSON, Perth Amboy, New Jersey.

Manufacturers of

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olling Mills, Blast Furnaces, Foundries, Works, Lime Kilns, Tanneries, Boiler and Grate Setting, Glass Works, &c.

Fire Clays, Fire Sand, and Kaolin for Sale.

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Tuyeres, Tiles, Blast Furnace Blocks, &c. Miners and Dealers in Woodbridge Fire Clay and Sand, and Staten Island Kaolin.

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GARDNER BROTHERS,

Manufacturers of

STANDARD SAVAGE FIRE BRICK, TILE & FURNACE BLOCKS,

OF ALL SHAPES AND SIZES.

Clay Gas Retorts and Retort Settings, and Miners and Shippers of Fire Clay.

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WORKS: Mt. Savage Junction, Md., and Lockport, Pa.

HALL & SONS,

FIRE BRICK,

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MILLER'S BRICK PRESSES

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FIRE and RED BRICK,

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SAML. P. MILLER & SON,

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The Morris Sash Lock Mfg. Co.

Manufacturers of

The Morris Sash Lock,
Pat. Combined Sash Lift & Lock,
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And specialties in **Builders' Hardware.**

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Mellert Foundry & Machine Co.,

Limited,

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Specials, Flange Pipe, Retorts, Valves and Hydrants, Lamp Posts, &c. **The Improved Canadian Turbine Water Wheel.** Machinery and Castings for Furnaces, Rolling Mills, Grist and Saw Mills, Mining Pumps, Hoists, &c. Columns, Brackets, Iron Railings, &c.

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HENRY DISSTON & SONS,

KEYSTONE SAW, TOOL, STEEL & FILE WORKS,

Front and Laurel Streets, PHILADELPHIA.

DISSTON'S SAMSON TREE PLANTER AND POST HOLE DIGGER,

Fig. 1.

Patented May 29, 1870.

Price, - - $37.50 per dozen.

Fig. 2.

No Farmer, Nurseryman, Railroad or Telegraph Company

SHOULD BE WITHOUT ONE.

NO BACK-ACHE.
NO KNEE-WORK.
NO CLOGGING.

This tool has been thoroughly tested, and has given the greatest satisfaction to all who have tried it. The principle on which it works makes it self-cleaning and prevents adhesion in sticky soil; therefore it always works free and easy. It is far superior to all plungers, augers and boring machines, as it works well in stony, sandy, or clay soils; quicksand under water is as easily removed as though no water existed.

DIRECTIONS.

Plunge the Digger into the ground, as shown in cut, Fig. 1, and when the soil is loosened pull out the lever with one hand, as shown in cut, Fig. 2, which will press the dirt between the blades; then draw the Digger from the hole, keeping hold of the lever with one hand and the handle with the other. When the Digger is clear of the hole, you can deposit the load anywhere within reach by simply pressing down the lever, which will open the blades, and the dirt will fall from between them. The Digger is then ready for another plunge. The steel blades are nine inches long, and the whole tool five feet long. *For Sale at Hardware and Agricultural Stores.*

HENRY DISSTON & SONS.

CHAMPION ONE-MAN SAW

WITH PATENT ADJUSTABLE ATTACHMENT. The only Saw that can be adjusted for either a One-Man or a Two-Man Saw. We make the following lengths, 3½, 4, 4½, 5 feet. Send for sample.

WHEELER, MADDEN & CLEMSON MFG. CO., Middletown, N. Y.

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Bolts, Nuts, Washers, Chain Links, Car Bolts, Bridge Bolts, Lag Screws, &c.

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FRENCH NAILS, ESCUTCHEON PINS, SMALL RIVETS & SCREWS,

And Specialties in this line made to order by

BLAKE & JOHNSON,

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NEWTON'S PATENT STEAM TRAP AND GRATE BARS,

MANUFACTURED BY

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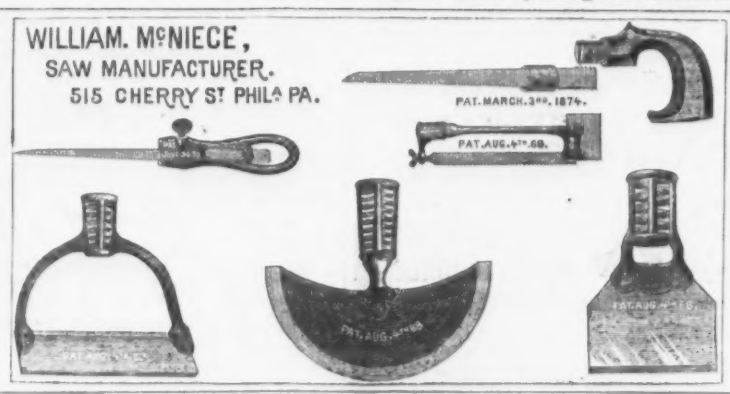
See *The Iron Age* first issue of each month. *Agents Wanted for Different Locations.*

NEW MAKE OF MINE LAMP.

LEONARD BROS., Scranton, Pa.

WILLIAM. McNIECE,
SAW MANUFACTURER.
515 CHERRY ST PHILA PA.



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MANUFACTURERS OF

Handles and Spokes,

79 Reade Street and 97 Chambers Street, - - - - NEW YORK.

HARDWARE COMMISSION MERCHANTS.

John T. Lewis & Bros.

No. 231 South Front St., PHILADELPHIA.

JOHN T. LEWIS & BROS. WARRANTED PURE WHITE LEAD. PHILADA.

TRADE MARK.

MANUFACTURERS OF

Pure White Lead, Red Lead, Litharge, Orange Mineral, Linseed Oil,

AND PAINTERS' COLORS.

Brooklyn White Lead Co.

TRADE MARK

White Lead, Red Lead & Litharge.

No. 182 Front Street, NEW YORK,

JOHN JEWETT & SONS,

Manufacturers of the well-known brand of

WHITE LEAD.

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ALSO MANUFACTURERS OF

LINSEED OIL.

182 Front Street, NEW YORK.

TRADE MARK.

The Atlantic White Lead and Linseed Oil Co.,

MANUFACTURERS OF

White Lead (Atlantic), Red Lead, Litharge & Linseed Oil.

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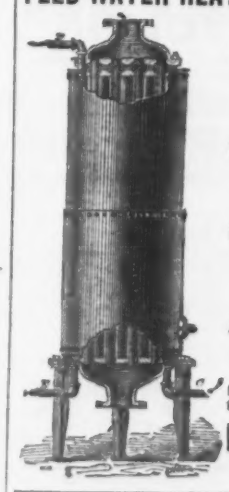
287 Pearl Street, New York.

THE LOWE PATENT

FEED WATER HEATER & PURIFIER.



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Heating and Purifying Water for Steam Boilers.

Patented July 12, 1877.

Has Straight Tubes.

SIMPLICITY, RELIABILITY and EFFICIENCY

At Less Cost

Than any Other.

Write for prices and further information to the manufacturers,

Lowe & Watson,

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THOMAS MORTON,

Manufacturer of

CABLE, COPPER, IRON AND STEEL SASH CHAINS, for suspending window sashes. Also, Copper Champion Chains, with patent attachments, for same purpose. Agents wanted in the principal cities in the United States. Apply at

65 Elizabeth Street, New York.

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(Corrected Weekly by Lloyd, Supplee & Walton.)

Terms, 30 days. For 60 or 90 days, interest added at 10 per cent. per annum.

Anvils.
Peter Wrights, ₩ ℔ ..10¾c
Over 250 lbs ..11c
Eagle (American) .100 ₩ ℔—dis 20 %

Apple Parers.
Keystone Centennial, 1875 ..$4.25
" 1877 ..5.00
Reading No. 72 ..5.00
" No. 74 ..6.00
" No. 75 ..7.00
" No. 78 ..7.50
Rotary Peach Parers ..13.50
Lots of 10 to 25 dozen special prices.

Axes.
Hunt's Kentucky and Yankee ..per doz $11.00
Mann's Red Warrior .." 11.00
Richland Chief .." 10.00
Beveled Axes ..add 50c " net
Double Bit Axes ..net " 22.00

Augers and Auger Bits.—New List January 1.
Bates' Nut Augers ..dis 40 %
Cook's Augers ..dis 40&10 %
Watrous' Ship Augers ..dis 15 %
Benjamin Pierce Auger Bits ..dis 35 %
Griswold Auger Bits ..dis 40 %
Cook's " " ..dis 40&10 %
Jennings' " " ..dis 10, 10&10 %
Bonney's Pat. Hol. Augers, list $48 ₩ doz. ..dis 20&10 %
Stearns' Pat. Hol. Augers, list $48 ₩ doz. ..dis 20&10

Balances.
Light and Common ..dis 15&10 %

Bells.
Bevin Bros. Mfg. Co. Light Hand Bells ..dis 60&10 %
Swiss Pattern Hand Bells ..low list dis 40&10 %
Connell's Door Bells ..dis 35 %
Gt. Western & Kentucky Cow, new list ..dis 50 %

Bolt and Rivet Clippers.
Chambers' No. 1. for ⅝ bolt ..each, $7.50
" No. 2, " ½ " ..." 9.00 } dis 15 %
" No. 3, " ⅝ " ..." 12.00

Boring Machines.
Upright, without Augers ..List 5.50
Angular, without Augers ..." 6.75 } dis 40 %

Bolts.—Eastern Carriage Bolts ..dis 75&10 %
Philadelphia " ..new list dis 60&10 %
Stanley, Wrought Shutter ..dis 50&10 %

Braces.—Barber's ..dis 40 %
Backus ..dis 50 %
Spofford ..dis 50&5 %
American Ball ..dis 55 %

Butts.—Cast Fast Joint, Narrow ..dis 45&10 %
" " " Broad ..dis 45&10 %
Cast Loose Joint, Narrow ..dis 55&10 %
" " Broad ..dis 55&10 %
" Acorn, Loose Pin ..dis 55&10 %
" " Jap'd ..dis 60&10 %
" Mayer's Loose Joint ..dis 60x10 %
Wrought Loose Pin ..dis 55&10 %
" Table Hinges and Back Flaps ..dis 60&10 %
" Narrow, Fast ..dis 50&10 %
" Loose Joint ..dis 55&10 %

Blind Butts.
Parker ..dis 70 %
Clark ..dis 75 %
Shepard ..dis 60, 10&10 %
Lull & Porter ..dis 66⅔&10 %
Huffer's ..dis 50 %

Chains.—German Halter and Coil. new list Oct. 22, 1879 ..dis 45 %
Galvanized Pump ..₩ ℔ 10c net
Best Proof Coil Chain—English.
₩ ℔ ..12 10 8½ 7½ 7¼ 7 gold
⅜-16 ½-16 ⅝ 7-16 ½ in.

Chisels.—Socket Framing ..dis 65&10 %
Socket Firmer ..dis 65&10 %
Butcher's ..$5.00 to £ gold

Casters.—Bed (new list July 1, 1880,) ..dis 35&10 %
Plate ..dis 35&10 %

Coffee Mills.—Box and Side, new list Jan. 1, 1880 ..dis 35&10 %
Enterprise ..dis 25 %

Cutlery.—Walden Pocket ..new list net
Landers, Frary & Clark, J. Russell & Co., Lamson & Goodnow Mfg. Co. and Meriden Cutlery Co., Manufacturers' prices net.

Drawing Knives.
Hart Mfg. Co.'s ..dis 65&10 %
Adjustable Handle ..dis 15 %

Fry Pans.
Tinned ..dis 45 %
₩ doz. $3.40 4.00 4.50 5.00 5.50 6.50 7.50 9.00 10.00
No. 0 1 2 3 4 5 6 8
Burnished ..dis 60 %
₩ doz. $3.00 3.75 4.25 4.75 5.25 6.00 7.00 8.00 9.00
No. 0 1 2 3 4 5 6 7 8

Files.
Nicholson ..dis 40 %
Disston ..dis 40 %
Butcher ..$4.50 £
Spencer ..$4.50 @ 4.75 £
E. M. Boynton, new list ..25 %

Fluting Machines.
Eagle—3½ in. roll ..each, $2.15 } dis 20 %
" —5½ in. roll ..." 2.85 }
Crown—4½ in. roll ..." 3.40 }
" —6 in. roll ..." 4.00 } dis 20 %
" —8 in. roll ..." 6.50 }
Geneva Fluter ..dis 25 %
Favorite com Fluter & Sad Iron ..₩ doz $10.50 net

Hammers.
Yerkes & Plumb's, new list ..dis 30 %

Handles.
Boynton's Pat. Saw Handles ..35c per pair net.

Hatchets.
Yerkes & Plumb, new list ..dis 30 %
Hunt ..dis 15&5 %

Hinges.
Strap and T ..dis 60&10 %

Horse Nails. Nos. 5 6 7 8 9 10
Ausable ..30 27 25 24 23 22
" Pol'ed & P't'd and Blued and Pointed. 31 28 2 25 24 23
Globe ..New list. 28 25 23 22 21 20
Clinton ..22 20 19 18 17
" Polished & Pointed ..23 21 20 19 18
Porter, all sizes ..₩ ℔ 15c. net
Discount on Ausable and Clinton, 30 %; Globe, 10%

Locks and Knobs.
Branford ..dis 45&2 %
Gaylord Cabinet ..dis 25&2 % cash
American Padlocks ..dis 40 &2 % cash
Scandinavian Padlocks ..dis 40 %
₩ doz. $5.00 5.50 6.50 7.50 8.50 10.00 12.50 } dis 60 %
No. 47 48 50 60 61 62 63 }
₩ doz. $18.00 26.00 33.00 } dis 60 %
No. 64 65 66 }

Lanterns.
Nail City ..₩ doz, $9.00 net
Square Candle and Oil ..₩ doz
Tubular ..No. 0, $8.05; No. 1, $10.15 ₩ doz net
Globes, 35 cents extra per doz. net.

Lawn Mowers.—Pennsylvania ..} new list
Philadelphia ..} dis 25 %
Excelsior ..}

Lawn and Garden Pumps.
Holland Patent ..List $4.00 dis 10 %

Mattocks.
Long and Short Cutter ..new list ..35 %
Pennsylvania Pattern ..per doz 35 %

Molasses Gates.
Enterprise Mfg. Co 's Measuring Faucets ..dis 24 %
Stebbins' Gates ..dis 70&10 %
Lincoln's " ..dis 50&10 %
Landers, Frary & Clark's Petroleum ..dis 20&10 %
Brass Liquor Cocks, new list Jan. 1 1880 ..dis 40 %
Cork Lined " ..dis 70 %

Meat Cutters.—Penna'vania sleat Cutter. dis 40&10 %
Dixon's ..dis 35 %
Woodruff ..dis 35 %
Stowe ..dis 30 %
Hale's ..new list, dis 40, 10&2 cash
American ..dis 25 %
Stuffers ..dis 35 %
Enterprise Stuffers ..dis 25 %

Planes.—Ohio Tool Co ..dis 25 % }
Scioto ..dis 30 % } ..10 %
Auburn ..dis 25 % }
New York Tool Co ..dis 30 % }
Bailey ..dis 20&10 %
Plane Irons.—Ohio Tool Co ..dis 20 %
Butcher's ..£, $5.50

Plumbs and Levels.
Stanley's Adjustable ..dis 65&10 %
" Non-Adjustable ..dis 65&10 %

Picks.—New list ..35 %

Pumps.—Bickford ..$5.00, dis 10 %

Rules.—Stanley Boxwood ..dis 70&10 %
Stanley Ivory ..dis 60&10 %

Steelyards.—Hart's Pattern ..dis 30&10 %
₩ doz. ..$14.50 17.75 21 00 26.50 31 00 35.50
Lbs ..40 100 150 200 250 300
American Pattern ..dis 30&10 %
₩ doz. ..$8.00 10.25 13.75 15.00 16.75 19.50
Lbs. ..80 100 140 200 250 300

Squares.
Steel and Iron ..dis 40 %; full case, dis 50&10 %
Try Squares, Stanley ..dis 50&10 %
Disston's Try Squares ..dis 40 %

Scythes.—Golden Clipper, Damascus Blade, Boxed and Sharpened ..₩ doz $9.00 net
Clipper No. 10, Bronzed Blade, Boxed and Sharpened ..₩ doz $8.50 net
Clipper No. 5, Painted Red, Boxed and Sharpened ..₩ doz $8.00 net

Saws.—Disston's Hand, Panel and Rip ..dis 20 %
Disston's Circular ..dis 40 %
Cross-Cut No. 2, Plain Tooth ..dis 40%
" Patent Tooth ..dis 40%
" Champion Tooth ..dis 40%
Boynton's Lightning Cross Cut, new list ..dis 20 %
" One Man, all lengths, " ..dis 20 %
" Billet Webs, 30 inch, " ..dis 25 %
" Lightning Buck Saws, cross bar ..dis 25 %
" " Hand, Panel and Rip ..dis 25 %

Shovels and Spades.
Rowland ..dis 40&10 %
Oliver Ames & Sons, new list ..dis 10 %
Griffiths ..dis 40&10 %

Sad Irons.—4 to 10 lbs ..₩ ℔ 35c
Mrs. Potts' Patent ..dis 35 %

Stone.—Arkansas Oil Stone ..₩ ℔ $2.00 net
Washita Extra ..₩ ℔ 27c net
" No. 1 ..." 18c
" No. 2 ..." 15c
" Slips ..." 36c
" Axe ..." 18c net
Turkey Oil Stone No. 1 ..₩ ℔ $1.00 net
Hindostan Oil Stone No. 1 ..₩ ℔ 60 }
" Axe Stone ..." 80 } dis 30 & 10 %
" Slips ..." 100 }

Screws.
Flat Head Iron ..dis 40 %
" Brass ..dis 40 %
Round Head Brass ..dis 30 %
" Iron ..dis 35 %

Spoons.
Plated ..dis 40, 5&2 %
German Silver ..dis 30, 10&5 %
Britannia, Boardman's ..dis 70 %
" Parker's ..dis 70 %
Tinned ..dis 10 %

Springs.—Torrey ..₩ doz $2.10 10 %
Philadelphia ..5 in., $8.00; 3 in., $7.00 ₩ doz. dis 25 %
Chatfield No. 1, $2.75; 2, $2.25; 3, $1.00 ₩ doz, dis 33⅓ %
Gem Coil No. 1, Large Jap'd ..₩ doz $3.50 }
" No. 2, Medium Jap'd ..." 2.50 } 25&10 %
" No. 3, Small Jap'd ..." 2.00 }

Stocks and Dies. ..dis 10&5 %

Stove Polish.—Gem ..₩ gross, $4.50, dis 5 %
Dixon .." 6.00, dis 10%
Onyx ..." $4.00 @ 4.25 net

Tacks. ..dis 30&10 %
Shoe Nails—4-8, 0½c.; 3½-8, 10c ₩ ℔ ..10 %
Double Pointed Tacks ..dis 40&5 %

Traps.
Genuine Oneida—Newhouse ..dis 30 %
Im. Oneida—Newhouse list, first qual ..dis 55 %

Vises.—Solid Box, Trenton new list ..dis 30 %

Wrenches.—Agricultural ..dis 60&10 %
Coes' Genuine ..dis 50 %
" " Mechanics' ..dis 50&10 %
" " Mall. Bar ..dis 70&10 %
Philada. Tool Co., Dupiex ..dis

Wire.
Bright or Ann'd, No. 0 to 18 ..dis 55 to 57½ %
" No. 19 to 26 ..dis 60 to 62½ %
" No. 27 to 36 ..dis 65 to 67½ %
Coppered, 0 to 18 ..dis 45 to 50 %
Tinned Broom Wire ..dis 47½ to 50 %
Galvanized No. 7 to 18 ..Market List, dis 35 to 40 %

Wringers.
Peerless No. 2½ ..
" 2 ..
Universal, No. 2½ ..
" 2 ..
Novelty, No. 10 ..
" " 2 ..

PITTSBURGH.

Merchant Iron.

TERMS.—Note or acceptance at 60 days, with current rate of exchange on New York, or a discount of 2 per cent. for cash, if remitted within 10 days from date of invoice.

Flat Bar.
1½ to 4 by ⅜ to 1 inch ..2.50
4½ to 6 by ⅜ to 1 " ..2.60
1½ to 6 by 1⅛ to 1¼ " ..2.90
1¼ and 1½ by ¾ to ¾ " ..2.60
1" and 1¼ by ¾ to ⅝ " ..2.90
⅝, ¾ and ⅞ by ¾ to ⅝ inch ..2.90

Rounds and Squares.
1 to 1⅛ ..2.50
1 to 2⅛ ..2.70
2¼ to 3¼ ..3.00
3⅜ to 4 ..3.50
4¼ to 5 ..4.00
¾ to ⅞ ..2.60

Oval Iron.
⅞ to 1⅛ ..2.90
⅞ to ¾ ..3.10

Half Oval and Half Round.
⅞ to 1¼ inch ..3.20
⅝ to ¾ " ..3.70

Horse Shoe.
¾ to 1¼ by 5-16 to ⅜ inch ..3.40

Wagon Box Iron.
⅞ Inch, Nos. 13 and 14 ..3.70
⅞ " " 11 and 12 ..3.50
¾ " " 13 and 14 ..4.00
¾ " " 11 and 12 ..3.80
⅝ " " 13 and 14 ..4.10
⅝ " " 11 and 12 ..4.10

Heavy Bands.
3½ to 6 by ¼ and 5-16 inch ..2.70
1⅜ to 3¼ by ¼ and 5-15 " ..2.70
1 to 1⅜ by ¼ and 5-16 " ..2.80
⅞ to ⅞ by ¼ and 5-16 " ..3.00
⅝ and ⅜ by ¼ and 5-16 " ..3.50

Light Bands.
1⅛ to 6 by 1/16 to 3-16 ..3.00
1⅛ to 6 by Nos. 11 and 12 ..3.10
1 to 1⅜ by 1/16 to 3-16 ..3.10
1 to 1⅜ by Nos. 11 and 12 ..3.20
⅞ and 13-16 by 1/16 to 3-16 ..3.40
⅞ and 13-16 by Nos. 11 and 12 ..3.50
⅝ and 13-16 by 1/16 to 3-16 ..3.70
⅝ and 11-16 by Nos. 11 and 12 ..3.80
⅝ and 9-16 by 1/16 to 3 16 ..4.00
⅝ and 9-16 by Nos. 11and 12 ..4.10
⅜ inch by 1/16 and 3-16 ..4.30
⅜ inch by Nos. 11 and 12 ..4.40

Hoop Iron.
1¼ to 4, Nos. 13, 14 and 15 ..3.30
1¼ to 2, Nos. 16, 17 and 18 ..3.40
1¼ to 2, No. 19 ..3.50
1¼ to 2, No. 20 ..3.60
1¼ to 2, No. 21 ..3.80
1¼ to 2, No. 22 ..3.70
15-16, 1, and 1⅛, Nos. 13, 14 and 15 ..3.60
15-16, 1, and 1⅛, Nos. 16, 17 and 18 ..3.70
15-16, 1, and 1⅛, Nos. 19 and 20 ..3.80
15-16, 1, and 1⅛, No. 21 ..3.90
15-16, 1, and 1⅛, No. 22 ..3.90
⅞, Nos. 13, 14 and 15 ..3.70
⅞, Nos. 16, 17 and 18 ..3.80
⅞, Nos. 19 and 20 ..3.90
⅞, No. 21 ..4.00
⅞, No. 22 ..4.10
13-16, Nos. 13, 14 and 15 ..3.90
13-16, Nos. 16, 17 and 18 ..4.00
13-16, Nos. 19 and 20 ..4.10
13-16, No. 21 ..4.20
13-16, No. 22 ..4.30
¾, Nos. 13, 14 and 15 ..4.00
¾, Nos. 16, 17 and 18 ..4.10
¾, Nos. 19 and 20 ..4.20
¾, No. 21 ..4.30
¾, No. 22 ..4.40
11-16, Nos. 13, 14 and 15 ..4.20
11-16, Nos. 16, 17 and 18 ..4.30
11-16, Nos. 19 and 20 ..4.40
11-16, No. 21 ..4.50
11-16, No. 22 ..4.60
⅝, Nos. 13, 14 and 15 ..4.40
⅝, Nos. 16, 17 and 18 ..4.50
⅝, Nos. 19 and 20 ..4.60
⅝, No. 21 ..4.70
⅝, No. 22 ..4.80
⅝, No. 23 ..4.90
9-16, Nos. 13, 14 and 15 ..4.60
9-16, Nos. 16, 17 and 18 ..4.70
9-16, Nos. 19 and 20 ..4.80
9-16, No. 21 ..4.90
9 16, No. 22 ..5.00
9-16, No. 23 ..5.10
½ inch, Nos. 13, 14 and 15 ..4.80
½ " Nos. 16, 17 and 18 ..4.90
½ " Nos. 19 and 20 ..5.10
½ " No. 21 ..5.20
½ " No. 22 ..5.30
½ " No. 23 ..5.40

The prices under Hoop Iron do not apply to Cotton Ties.

1-10c per lb. extra will be charged for each gauge lighter than the lightest indicated.

1-10c per lb. extra will be charged for cutting Hoops to specified lengths.

Barrel Hoops.
1¾ to 2 in., cut to length.
9 to 11 lbs, per set of 6 hoops ..3.50
8 lbs. and less than 9 lbs. per set of 6 hoops ..3.60
Less than 1bs. per set of 6 hoops ..3.80

Extras for Cutting to Length all Preceding Iron.
All Iron, including Tire ..1.10c

Tank Iron.
No. 9 and heavier ..3.30
Plow Slabs ..3.50
" Wings ..3.80

Sheet Iron.

	Common.	Charcoal.	Juniata.
No. 10 to 14	3.50	5.00	6.50
No. 15 to 17	3.80	5.30	6.80
No. 18 to 21	4.10	5.60	7.10
No. 22 to 24	4.30	5.80	7.30
No. 25 & 26	4.50	6 00	7.50
No. 27	4.70	6.20	7.70
No. 28	4.10	6.60	8.10

All sheets No. 18 and lighter, over 30 inches wide, not less than 2.10c extra.

Wood's Patent Planished Sheet.
1st quality (A) ..11c | 2d quality (B) ..10c

Galvanized C. H. B.—(Charcoal Hammered Blooms.)
Nos. 14 to 20 ..12c | No. 27 ..15c
Nos. 21 to 24 ..13c | No. 28 ..16c
Nos. 25 and 26 ..14c | No. 29 ..18c
Current discount, 37½ & 40 %.

Coal Screen Iron.
1¾ by ⅝ by 5-16 ..3.00 | 1 by ⅝ by 5 16 ..3.50

Angle Iron.
2½, 3, 3½ and 4 inch ..3.30
1½, 1¾, 2 and 2¼ inch ..3.30
1¼ inch ..3.40
1 " ..3.60
1¼ by 1 inch, for Plow Handles ..3.80
1¼ by ¾ " " ..3.80
1⅜ by ⅝ " " ..3.90

T Rail.
8 lbs. to the yard ..2.90 | 20 lbs. to the yard ..2.80
12 " " ..2.80 | 28 " " ..2.80
16 " " ..2.80 | 40 " " ..2.80

Splice Joints for 12, 16 and 20-lb. Rail, 40c each; 28 and 30-lb. Rail, 50c each; 40 lb., 60c each.
3½ by ⅝ and ⅜ Spikes for 20 and 28-lb. Rail ..4½c
2½ and 3 by ⅝ " " 12 and 16-lb. " ..4½c
2½ by 5-16 " " 8-lb. Rail ..5½c

Flat Rails.—Punched and Countersunk.
1¼ to 2 by ¼ to ⅝ inch ..3.00
1½ by ⅜ and 7-16 inch ..3.20
1¾ by ⅜, 7-16 and ½ inch ..3.50
Juniata Nail Rods ..6.50
Norway " ..8.00
Guard Iron ⅞x¾x⅝ and ⅞x⅝x⅝ ..4.00
" ⅝x⅜x9-16 and ⅞x⅜x½ ..4.20
Drag Bars ..3.30
Dropper Bars ..3.20
Cylinder and Landside Iron ..3.20
Plow Beam Iron ..3.00

Nails.
10d to 60d ..$2.85

Best Quality Refined Cast Steel.
Square, Flat, Octagon and Round.
⅜ to 2 inches, inclusive ..11½c
5-16 and 2¼ to 3 inches ..12½c
¼ and 3⅛ to 4 " ..13½c
7-32 and 4⅛ to 5 " ..14½c
3-16 and 5⅛ to 6 " ..17½c
5-32 inch ..21½c
⅛ inch ..29½c
Oil Well Steel Forgings ..20 c
No grade of Crucible Tool Steel shall be sold for less than above prices.

Machinery Steel.

	Crucible.	Bessemer & Open Hearth.
Ordinary Sizes, ⅜ to 2 inch		
Round	6½c	5c
5-16 and 2⅛ to 3 inches	7½c	6c
¼ and 3⅛ to 6 "	8½c	7c
7-32 inch	9½c	8c
3-16 "	11½c	10c

Square, Flat and Octagon, ½c extra throughout the list.
Cut to specified lengths, ½c extra.

Hammer Cast Steel.
2 inches and under ..7 c
Above 2 inches ..8 c

Sheet Steel.—Crucible.

	Best.	2d Qual.	3d Qual.	Bessemer & Open Hearth.
To 21 gauge	12c	10c	8c	6c

1c. extra for each additional gauge.
Cut to multiples or specified lengths, ½c. extra.

Miscellaneous Cast Steel.
Auger and Auger Bit ..7c
Axle Steel for carriages and wagons ..7c
Frog Points and Plates ..8½c
" Side Bars ..6½c
Pick, plain ..7½c
" and Mattock, beveled ..7½c
Skate Steel ..7½c
Table Cutlery ..7½c
Pike and Cant Hook ..7½c
Coal and Granite Wedge ..7½c
Roller ..7½c
Spindle, subject to Machinery classification ..6c
Trap Spring Steel ..7c
Forged Crank Pins and Lathe Spindles ..8c
Piston Rods, plain ..9c
" forged to shapes ..6½c
Slide Bars, plain ..9c
" forged to shapes ..6½c

Crucible, Open Hearth or Bessemer.
Boiler, Fire-Box and Flue Sheets, not less than 3-16 thick ..9c
Boiler, Fire-Box and Flue Sheets, not less than ⅛ thick ..9c
Circulars and semi-circulars, when ordered separately ..9c
Smoke Stack, to shape ..9c
Locomotive Tank Steel ..

File Cast Steel.
Square, Round, Half Round and Flat Bastard, 8-inch and over ..8c
Mill Saw, 8-inch and over ..8½c
Taper, 3½-inch and over ..8½c
Horse and Shoe Rasp ..9½c

Spring Cast Steel.
Spiral and Taper, cut to lengths ..6½c

Tire Cast Steel.
1x¼ and over ..7½c
1x3-16, ¾x3-16 and ¼ ..8c
1 and 13-16x1¼ and 5-32, ⅞x3-16 and 5-32 ..8½c
¾ and ⅞x1¼ and 3-32 and 12 g ..9c
Solid Safe Cast Steel ..7c

Agricultural Implement Cast Steel.
Fork and Rake, Crucible ..7c
Horse Rake Steel, cut to lengths, Crucible ..7½c
Hoe, Crucible ..7½c
Corn Stalk Cutter, beveled ..6½c
Beveled Hoe and Shovel Steel in Bars ..7½c
Crucible Plow Steel in slabs ..7½c

Bessemer and Open Hearth.
Spring ..4½c
" spiral and taper, cut to lengths ..5½c
Tire, 3-16 thick and above ..4½c
Toe Calk ..4½c
Plow ..4½c
Axle Billets ..4½c
Sleigh Shoe ..4c
Cutter Shoe, cut to lengths and tapered ..4c
Scythe Back Steel ..5½c
Grain Drill Bars ..4c
" Points ..7½c
Rolling Coulter Blanks, cut and punched ..8½c
Thrasher Steel ..9½c
" Teeth ..4½c
Rolled Hammer Billets ..4½c
Where Bessemer or Open-hearth Steel can be used in place of Crucible, the difference in price shall not be greater than 1c. per lb., except where especially provided in the list.
Terms.—Four months; 3 per cent. discount for cash, if remitted within 30 days.

Rolls and Castings.
Furnace, Floor and Straightening Plates ..2½c
Housings and Castings not otherwise specified ..3 c
Guide Plates ..3½c
Spindles and coupling boxes ..3 c
Sand Rolls and Pinions, large size ..3 c
" " small size ..3½c
Pipe Mill Castings ..4 c
Rolling Mill Castings under 50 lbs ..4½c
Spur and Bevel Wheels, large ..4 c
" " small ..4½c
Pulleys up to 30 inches ..4½c
" over 30 inches ..4½c
Engine Castings, light ..4½c
" " heavy ..4 c

Chilled Rolls.
6 to 7 in. diam., 7 to 20 in. long ..5 c
8 to 15 in. " 8 to 40 in. " ..5 c
25 to 24 in. " 15 to 72 in. " ..5 c
14 to 31 in. " 72 to 108 in. " ..4½c

White and Red Lead.
Strictly Pure White Lead in Oil, in kegs, 7c.; in 25 and 50 ℔ Tin Pails, ½c. ₩ ℔ over keg price; 12½ ℔ Tin Pails, 1c ₩ ℔ over keg price; assorted, 1 to 5 ℔ 100 ℔ Cases, 10c.
Dry White Lead ..7 c
Orange Mineral, genuine, in kegs, 9c; in barrels, 8½c
Red Lead, very brilliant, " 7c; " 6¾c
Litharge (Potter's Lead) " 7c; " 6¾c
Freights equalized with all points.
Terms: Note at sixty days, or if paid within 15 days from date of invoice, a discount of 2½ per cent. will be allowed, but not otherwise.

Window Glass.
Per Box of 50 Feet.—Discount 60&20 % on single strength, 70&5 % on double.

Single Strength.

Size.	A.A.	A.	B.	C.
6 x 8 to 10 x 15	$8.25	$7.50	$7.00	$6.50
11 x 14 to 16 x 24	9.25	8.50	8.00	7.25
18 x 22 to 20 x 30	10.75	9.75	8.75	7.75
15 x 36 to 24 x 30	12.25	10.75	9.00	8.50
26 x 28 to 24 x 36	13.00	11.50	9.75	9.00
26 x 36 to 26 x 44	14.50	13.25	10.75	9.50
26 x 46 to 30 x 50	15.00	14.00	11.25	10.50
30 x 52 to 30 x 54	16.00	14.50	12.00	
30 x 56 to 34 x 56	17.25	15.50	13.50	
34 x 58 to 34 x 60	18.25	17.25	15.00	
36 x 60 to 40 x 60	20.75	18.75	17.25	
Double Strength.				
6 x 8 to 10 x 15	12.75	11.75	10.75	10.00
11 x 14 to 16 x 24	14.50	13.25	12.50	11.25
18 x 22 to 20 x 30	17.25	15.75	14.00	
15 x 36 to 24 x 30	19.75	17.25	14.50	
26 x 28 to 24 x 36	21.00	18.50	15.75	
26 x 36 to 26 x 44	23.25	21.25	17.25	
26 x 46 to 30 x 50	24.00	22.50	18.00	
30 x 52 to 30 x 54	25.75	23.25	19.25	
30 x 56 to 34 x 56	27.75	25.00	21.75	
34 x 58 to 34 x 60	29.25	27.75	24.00	
36 x 60 to 40 x 60	33.25	30.00	27.75	

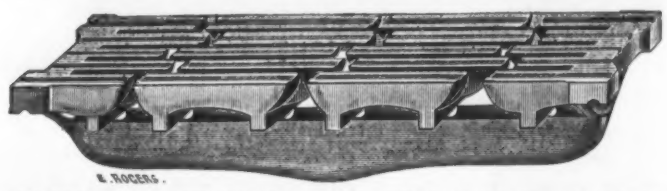
An additional 10 per cent. will be charged for all glass more than 40 inches wide. All sizes above 52 inches in length and not making more than 81 united inches, will be charged in the 84 united inches bracket.

DAVID S. CRESWELL,

816 Race Street, - - - - PHILADELPHIA, PA.,

Manufacturer of

W. C. WREN'S PATENT GRATE BAR.



This Grate Bar consists of short parallel bars for carrying the coal, mounted above a long supporting bar, extending across the furnace by short transverse plates, holding the short bars, which sustain the heat so far above the supporting bar that it is kept comparatively cool, and is not, therefore, liable to warp, bend or burn. The bars which are subject to the heat, being made in short sections, do not strain the supporting bar. The short bars break joints at the meeting ends to prevent a straight open space across the whole; also to guide the rake used by firemen in cleaning the furnace better than they otherwise would.

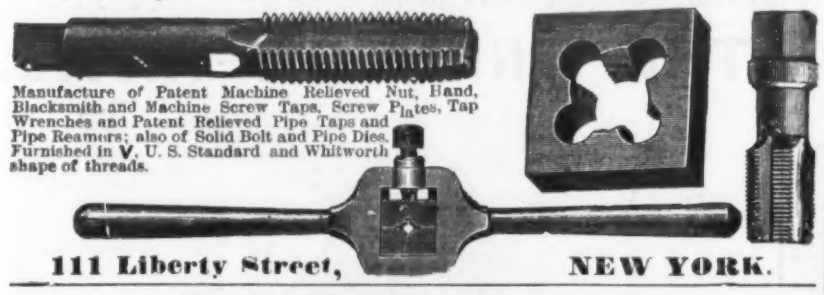
We therefore claim the following advantages over other grate bars offered for sale:

1. Great saving in fuel.
2. Such construction as will equalize all strain resulting from expansion and contraction, thus avoiding warping, and thereby insuring long service.
3. Thorough combustion of fuel, owing to the large air spaces exposed.
4. Bars will not weigh more in proportion than the ordinary bar, and in addition to a saving of 25 per cent in fuel, will last much longer than any other bar in use.

The **WREN GRATE BAR** is in use at the works of the Atlantic Refining Co. and other prominent concerns.

H. S. MANNING & CO.,

Sole Sales Agents for **THE MORSE TWIST DRILL AND MACHINE CO.'S**



Manufacture of Patent Machine Relieved Nut, Hand, Blacksmith and Machine Screw Taps, Screw Plates, Tap Wrenches and Patent Relieved Pipe Taps and Pipe Reamers; also of Solid Bolt and Pipe Dies. Furnished in V, U. S. Standard and Whitworth shape of threads.

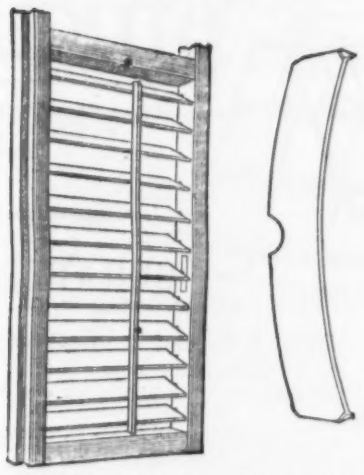
111 Liberty Street, NEW YORK.

BENTLEY'S

Perfect Blind Slat Holder.

Patented.

SUPERIOR TO ALL OTHERS.



For tightening the Slats of Window Blinds and holding them at any required angle.

The sunlight is let in or shut out at will.

The blinds are made a much better protection from cold, because when the slats are shut they are so kept by the Holder and cannot be moved by the action of the wind.

Noisy rattling of the slats is prevented.

The holder is securely held by its spring and the sharp points at each end.

As it is made of brass it will not rust.

It cannot get out of order.

Its superiority over other holders is evident.

It requires no screws or nails to fasten it to the blind. Any one can apply it.

It cannot get loose or deface the blind as others do.

Retail Price, 5 cents each; 50 cents per dozen;

At which price samples will be mailed postpaid.

Trade Price, $6 per gross; Discount 50 per cent.

FOR SALE BY THE TRADE.

In case your jobbing house cannot supply you, orders will be promptly filled by

R. W. BENTLEY, Sole Manufacturer,

41 FOURTH ST, BROOKLYN, E. D., N. Y.

RIPLEY & KIMBALL,

Nos. 907, 909 & 911 N. Main St., ST. LOUIS.

IRON & STEEL BOILER PLATES & SHEETS.

Brass and Iron Fittings for Steam.

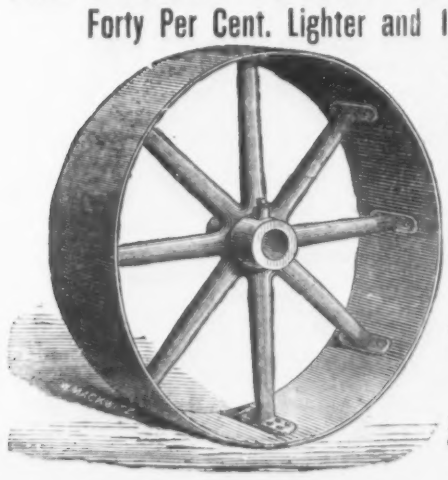
Lap-Welded Pipe & Boiler Tubes

RAILWAY AND BOILER MAKERS' SUPPLIES.

AGENCY NATIONAL TUBE WORKS CO.

THE MEDART PATENT WROUGHT RIM PULLEY.

Forty Per Cent. Lighter and 100 Per Cent. Stronger



than any cast pulley. No shrinkage strains; perfectly balanced for high speeds; better surface for belt, and

The Cheapest Pulley in the Market.

We make these Pulleys from 10 inches to 10 feet diameter, any face, crowning or straight, split or whole, single or double arms.

Large Pulleys a Specialty.

Send for price list.

The Hartford Engineering Co.,

HARTFORD, CONN.

Sole licensed manufacturers for the New England, Middle and Atlantic Coast States.

Also Shafting, Hangers and Couplings.

L. M. RUMSEY MFG. CO.

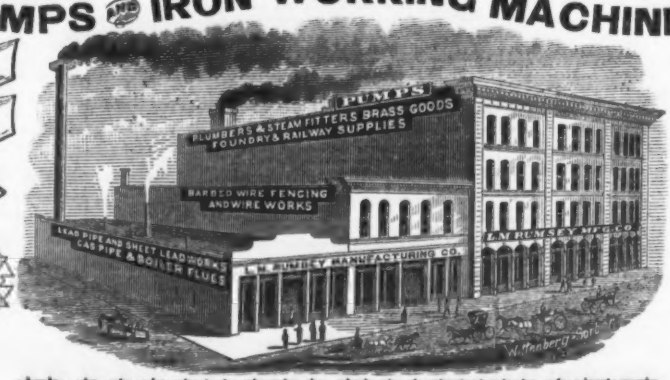
MANUFACTURERS & JOBBERS OF

PUMPS AND IRON WORKING MACHINERY,

LEAD PIPE & SHEET LEAD

PLUMBERS & STEAM FITTERS BRASS GOODS

BARBED WIRE FENCING & FENCE WIRE



GAS PIPE & FITTINGS

BELTING, HOSE, PACKING,

PUMP CHAIN &c.

RAILWAY SUPPLIES

Nos 804 TO 820 N. SECOND ST.

ST. LOUIS, MO.

Gentlemen.—This cut illustrates our

CAST IRON

Furnace Lamps

which are superceding entirely the Tin Lamps wherever introduced, in consequence of their durability. They are now extensively used in the Iron Districts of Ohio and some in Pennsylvania.

We call your attention to and solicit your order for them, confidently asserting that they are an **A No. 1 article in every respect.**

Sample sent if desired.

PRICE, $12 PER DOZEN.

Taylor & Boggis,

CLEVELAND, O.

THE LEADING WRINGER OF AMERICA.

SIMPSON & GAULT (PEERLESS WRINGER CO.),

New York Office. *79 Chambers St.* European Offices, *Place Vendome, Paris. 7 Poultry, London.*

Office and Factory, CINCINNATI, OHIO.

THE

PEERLESS

CLOTHES WRINGERS.

Sold by the Jobbing Trade everywhere. Most Saleable Wringer in the market.

MR. L. F. BLUE, who has been in our employ for a great many years, is our SOLE AGENT, and will visit the jobbing trade throughout the United States.

American Tool Co.,

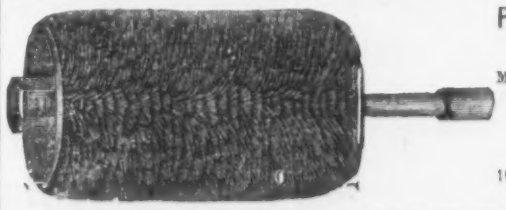
Manufacturers of

Tool Chests of all Sizes.

Adapted for the use of **Boys, Youths, Gentlemen, Farmers, Planters, Carpenters and Railroads**; fitted up complete with a superior quality of **Tools**, and suited to the wants of the **Hardware, Toy, Notion and Variety** trades. **Illustrated descriptive catalogue** furnished on application. **Export trade** solicited, **and a full stock of large-sized Chests always on hand.** Quality considered, we think our goods will be admitted by buyers the cheapest that have yet been offered by any manufacturer in the United States or Europe.

MECHANICS' TOOLS AND HARDWARE SPECIALTIES.

Warehouse and Salesroom, 116 Chambers St. New York U. S. A



PATENT STEEL TUBE AND FLUE BRUSH.

Manufactured and for sale in the

L. B. Flanders Machine Works,

1025 Hamilton St., - - - - PHILADELPHIA.

Descriptive circular on application

TRADE MARK

WICKERSHAM & CO.,

MANUFACTURERS OF

Railway, Miners', Mill & Machinists' Supplies

W. & Co.'s Packing: Steam, Hydraulic and Locomotive. Samples sent free.

Lubricants for Engines, Shafting, &c.; Rolling Mill, Railroad, Gear and Axle Grease.

Also, Star Cylinder Oils.

Samples sent free for trial upon application.

No. 308 Branch Street, Philadelphia, Pa.

CHAMPION **HOG RINGER** RINGS and HOLDER.

Only double Ring ever invented. The only Ring that will effectually keep Hogs from rooting. No sharp points in the nose.

EAGLE BILL **CORN HUSKER**

Is the best Husker in the market. Farmers say it is the best. Use no other.

BROWN'S **HOG AND PIG** RINGER and RINGS.

Only single Ring in the market that closes on the outside of the nose. No sharp points in the nose to keep it sore.

Rings 1c. 75c. Rings, 60c. 100. Holders, 75c. Huskers, 15c.

CHAMBERS, BERING & QUINLAN, Exclusive Manufacturers, Decatur, Ill.

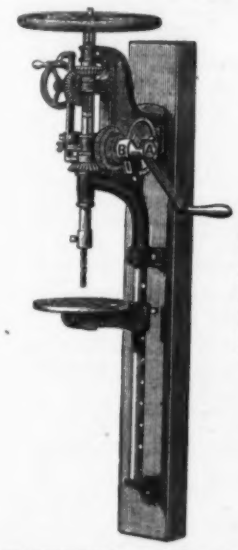
GEORGE C. TAFT,

Worcester, Mass., U. S. A.,

Manufacturer of

Improved Upright and Horizontal Self-Feed Drills,

For Blacksmiths' and Carriage Makers' Use.



Illustrated circulars, giving descriptions of my several size drills, sent on application.

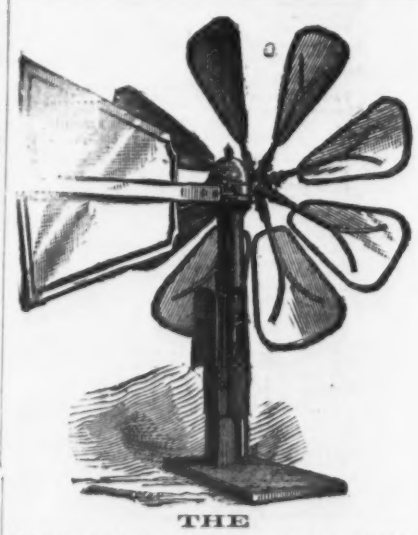
This cut represents my No. 2 Improved Drill, double geared, so arranged that by moving the crank from A to B it will give a slow motion for heavy drilling to the drill spindle.

THE LA FRANCE FIRE ENGINE CO.

Manufacturers of

Rotary Steam Fire Engines

ELMIRA, N. Y.



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HARTFORD COMPRESSED AIR PUMP

Water Driven to any Hight and Distance by Compressed Air.

Country Houses Supplied Cheaply and Certainly for Bath Rooms, Water Closets, Hot and Cold Water Faucets, &c. Plenty of Fresh Water for Stock on Farms. The best Pump for Irrigating, supplying Railroad tanks, and for Mining purposes. For Circular and Price list address, **EZRA BROOKS,** Sec'y and General Manager of The Hartford Compressed Air Pump Co., **Hartford, Conn., U. S. A.**

John Waldron,

Manufacturer of

Sprout's Double and Single Shear

Horse Hay Forks

And

Sprout's

HAY ELEVATORS, PULLEYS and GRAPPLES.

Send for Circulars.

Muncy, Lycoming Co., Pa.

BOSTON.

Reported by Macomber, Bigelow & Dowse.

Anvils.—"Eagle American".....₩ ℔ 9½c. dis 20 %
Anvil & Vise.—
No. 1, $4.25; 2, 4.25; 3, 3.50 each.....dis 25 %
Augers & Bitts.—Snell's Auger.....dis 40&10 %
L'Hommedieu's Ship Augers.....dis 15 %
Jenning's Bitts.....dis 10&10&10 %
Cook's Bitts.....dis 40&10 %
Sheparason's Double-Cut Bitts.....dis 45 %
" " Gimlets.....dis 40 %
Stearn's Extension Hollow Augers—
No. 2, ₩ doz, $48.00, No. 3, ₩ doz, $60.00 list, dis 20 %
Bonney's Extension Hollow Augers....₩ doz $36.00
Pierce's Bitts.....dis 40 %
Griswold " .....dis 40&10 %
Axes.—Blue Jackets.....per doz 9.00
Red Cross.....per doz 8.00
" Handled.....per doz 12.00
Dowse " Boys'.....dis 33⅓ %
Ax Handles.—
Oak Extra, 31 in., No. A.....₩ doz $2.00
" 34 in., No. A.....₩ doz 2.25
" 31 in., No. B.....₩ doz 1.40
" 34 in., No. B.....₩ doz 1.75
" 31 or 34 in., No. C.....₩ doz 1.15
Axle Clips......dis 50 %
Balances.—Chatillon's.....dis 15&10 %
Barn Door Rail.—
Cast Angle (for Anti-Friction Hangers)....per ft. 3c
" Half-Round.....per ft, ⅝, 3½c ¾ 4c
Wrought " .....per ft, ½, 4c; ⅝, 5c; ¾, 6c
Bells.—Connel's Crank Gong reduced list..dis 20&10 %
Bird Cages.
Japanned M. B. & D., reduced list, 1879.....dis 40 %
Brass " " 1879.....dis 33⅓ %
Blind Fasts.—Lock Fasts.....₩ C sets $6.00
No. 6 Fasts.....₩ C sets 6.50
Veazie Fasts.....₩ C sets 6.50
Shedd's.....₩ C sets 7.00
Blind Hinges.—Mall. Hook, 3 holes....₩ C sets 8.50
Brad Awl Handles.—
Phœnix Adjustable.....₩ doz $2.00
Bolts.—Norway Iron Carriage.....dis 70&5 %
Common " .....dis 80&5 %
Borax.—Refined.....₩ ℔ 14½c
Boring Machines.
Eagle Upright each, ...$5.50 list } dis 40& 20%
Eagle Angle each, ...6.75 list }
Snell Augers.....₩ set 2.43
Braces.—Barber's.....dis 10 %
Spofford's.....dis 50 & 5 %
Backus'.....dis 50 & 10 %
Bracket Saws.—Holly Scroll Saw.....each, $2.50
Deman Lathe and Scroll Saw.....6.50
Bracket Saws, extra quality, to No. 5.....₩ gro $0.75
Steel Frame, with patterns.....₩ doz 6.50
Lester.....dis 20 %
New Rogers, all iron.....dis 25 %
Bracket Saw Blades.
Griffith's patent.....₩ gross 750
Brackets.—R. B. & M. Flower Pot reduced list—
.....dis 25&10 %
Bronzed Shelf, M. B. & D. newlist.....dis 50&10 %
Store Shelf.....dis 40&10 %
Bronze Hardware.—
Butts.—Union Fast Joint.....dis 45&10 %
" Loose " .....dis 55&10 %
" Japanned Acorn.....dis 55&10 %
" Silvered " .....dis 55&10 %
" Boston Finish.....dis 70&10 %
Union Spiral Spring .....dis 25&10 %
Wrought Brass.....dis 45 %
Carriage Bolts.—Eagle Norway.....dis 70&5 %
Common .....dis 80&5 %
Carriage Jacks.
"Climax" No. 1.....₩ doz $20.00
" No. 1½....." 14.00
" No. 2 ....." 13.50
"Universal".....dis 25 %
" No. 1.....each, $2.00
" No. 2....." 3.00
" No. 3....." 5.00
" No. 4....." 6.00
" No. 5....." 6.40
Cartridges.—U. S. Cartridge Co.....dis 60&10 %
Cards.—Watson's makeHorse and Curry ..dis 10 %
" Cotton.....dis 10 %
" Wool.....dis 10 %
Casters.—Bed and Table. .....dis 35&10 %
Chain.—Traces 6½, 10, 4, straight.....₩ pair 45c
" 6½, 10, 4, twisted.....₩ pair 60c
" 7, 12, 2, " .....₩ pair 75c
Coil 3-16.....₩ ℔ 11 c
" ¼.....₩ ℔ 8 c
" 5-16.....₩ ℔ 7 c
" ⅜.....₩ ℔ 6 c
" 7-16.....₩ ℔ 5½c
" ½.....₩ ℔ 5½c
Chalk.—White, Carpenter's.....₩ gross 900
Red, Carpenter's.....₩ gross 800
Blue. " .....₩ gross $1.00
Chisels.—Hart, Riven & Mead, Framing1s&2s.dis 10&10 %
Underhill, Framing.....dis 20 %
Buck's Chisels.....dis 30 %
Clothes Line.—
Galvanized Wire, 100 feet each.....₩ doz $4.00
Coat Hods.—"Dover."—Galvanized, new list..dis 50 %
Japanned, new list.....dis 50 %
Coffee Mills.—New list.....dis 33⅓ & 10 %
Copper Rivets......dis 33⅓ %
Cow Ties......dis 33⅓ %
No. 20, 3 ft. No. 6 Wire, with toggle.....₩ doz $2.00
No. 35, 3 ft. " " with snap.....₩ doz 3.80
No. 40, 3½ ft. " " with toggle.....₩ doz 3.90
No. 45, 3½ ft. " " with snap.....₩ doz 4.10
No. 50, 4 ft. No. 4 " with toggle.....₩ doz 4.50
No. 55, 4 ft. " " with snap.....₩ doz 4.75
No. 60, 4½ ft. " 3 " with toggle.....₩ doz 5.25
No. 65, 5½ ft. " " with snap.....₩ doz 6.00
Cocks.—Brass, L. P. & C.....dis 40 %
Cordage.—Manila, usual trade dis 10.....₩ ℔ 14½c
Jute.....₩ ℔ 9c
Crow-Bars. Cast Steel.....₩ ℔ 8c
Iron, Steel Pointed.....₩ ℔ 8c
Cutlery.—Pocket, American Shear Co.'s.....dis 40 %
Butcher Knives, "Woods," Lap Bolster, Square Handle.....dis 30 %
Steak Knives.....dis 25%
Lap Bolster, Oval Handle.....dis 20 %
Sticking.....dis 30 %
Skinning.....dis 30 %
Butcher, Common Round Handle, "Woods".....dis 30 %
Shoe Knives, "Woods".....dis 30 %
Dividers.—Cook's.....dis 25 %
Dog Collars......dis 30 %
Dog Muzzles.—Automatic.....dis 15 %
Door Springs.—Torrey's Rod.....₩ doz $2.00
Imitation Torrey's Rod.....₩ doz $1.75
Gem Coil, new list.....dis 33⅓ %
Crown.....₩ doz $1.25
Warners.....₩ doz $2.00
Door Stops.—"Thurston's".....dis 50 %
Drawer Knobs.—"Thurston's".....dis 50 %
Drills.—Morse Bitt Stock.....dis 25 %
Morse Straight Shank.....dis 20 %
Emery.—Wellington Mills.....₩ ℔ 10c
The Alden Emery Co.....₩ ℔ 6c
Turkish in 10 ℔ cans.....₩ ℔ 8c
Enamelled Ware.
Standard Mfg. Co. Kettles.....dis 40&10 %
" Sauce Pans.....dis 25 %
Felloe Plates.—Wrought.....₩ ℔ 9c
Files.
American File Co.....dis 40 %
Nicholson " .....dis 40 %
Fluting Machines.
Knox list, $2.00.....dis 20 %
American list, $3.40.....dis 20 %
Forks. W. C. & Co., Manure.....dis 50 %
Gimlet Bitts.
Genuine German, No. 125, 1-32 to 8-32, per doz $1.00
Pierce's.....per doz 80c
Glass Cutters.
Combination Glass Cutter and Knife Sharpener.....₩ doz $1.00
Grub Hoes.—K. P. & Co.'s No. 2, 11.50 ₩ doz.dis 30 %
Hammers.—Maydole's.....dis 15 %
Hartford Hammer Co.....dis 20 %
Hangers & Rollers.—Anti-Friction.....dis 50&10 %
Acme Rollers.....dis 50 %
Climax.....dis 50 %
Common Hangers.....dis 30&10 %
" Rollers.....dis 33⅓&10 %
Hand Screws......dis 10 %
Hatchets.—C. F. Dowse new list.....dis 33⅓ %
Underhill.....dis 25 %
Hay Knives.—Lightning.....₩ doz $18.00 net
Fisher's Patent.....₩ doz @14.00
Hinges.—Strap and T (new list).....dis 60&10 %
Providence Plate.....₩ ℔ 40
Wrought Screw Hook.....₩ ℔ 40
Hoes.—W. C. & Co.'s.....dis 50 %
Hooks and Staples.—Brewers'.....dis 40 %
Horse Nails. No. 5 7 8 9
National Finished.....25 .21 .20 .19....dis 20 %
Putnam Pointed.....24 .26 .25 .24....10&10 %
Horse Nails.—Bridgewater.....dis 25 %
No. 7, 21; No. 8, 20; No. 9, 19.
Ice Cream Freezers.—"Packer's" new list dis 40 %
Knobs.—"Norwalk." New list.....dis 15 %
Silver Glass.....dis 50&10 %
" Bell Pulls.....dis 50&10 %
Lanterns.—Guarded No. 90.....₩ doz 7.50
Tubulars, No. 0.....₩ doz 4.00
Railroad, Oil, No. 43.....₩ doz 9.00
Triangular.....₩ doz 4.00
Hurricane.....dis 20 %
Lawn Mowers.—The "Daisy."
12 in. cut.....each, $8.50
14 in. cut....." 9.00
16 in. cut....." 9.50
18 in. cut....." 10.00
Lead.—Sheet.....₩ ℔ 7 c
Pipe.....₩ ℔ 8½c
Locks.—Norwalk Genuine Bronze Goods.....dis 45 %
Eagle Cabinet.....dis 25 %
" Trunk.....dis 15 %
W. Wilcox & Co., Padlocks.....dis 40 %
American Lock Co.'s Steel Key.....dis 33⅓ %
Manure Forks.—W. C. & Co.....dis 50 %
Mattocks.—K. P. & Co., Long Cutter, 19.00 ₩ doz.
K. P. & Co., Short Cutter, 15.50 ₩ doz.....dis 30 %
" Pick " 16.00 ₩ doz.....dis 30 %
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Meat Cutters.—Miles' Challenge.....dis 30 %
Hale's, (New list).....dis 40 & 10 %
American.....dis 25 %
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Mouse Traps.—Delusion.....₩ doz 2.00
Novelty.....₩ doz 1.75
Nails......₩ keg, 3.00 rates
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Brass and Copper.....dis 40 %
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1¼ in., " " 8.00 | 2½ " " 11.00
Padlocks.—W. Wilcox & Co.'s.....dis 40 %
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Tarred Sheathing.....₩ ℔, 2½c
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" " 6 to 7 ℔ 13.00....dis 30 %
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N. Y. Tool Co.....dis 30 & 10 %
English Iron.....dis 20 & 10%
Bailey's.....dis 20&10 %
Plated Ware.—Rogers & Bro.....dis 10 & 5 %
Pliers.—Vom Cleff & Co.'s.....net list
Button's Wire Pliers.....dis 33⅓
Plumb & Levels.—Stanley, R. & L. Co..dis 60&10
Pocket Knives.
American Shear Co.'s.....dis 40
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Pulleys.
Acme or Excelsior, 1¾ in.....per doz 2.00
" " 2 in. " 2.40
Pulley Blocks.....dis 40 %
Pumps.—Union Manufacturing Co.
Iron Cistern.....dis 50 %
" Pitcher Spout.....dis 50 %
Copper.....dis 30 %
Rivets.—Black.....dis 65 %
Carriage in 10 ℔ papers.....dis 45 %
Copper.....dis 33⅓ %
Razors.—Torrey's.....dis 10 %
Razor Strops.—Torrey's.....Full line
Rules.—Stanley.....Boxwood, dis 70&10 %
" Ivory dis 60&10 %
Sadirons.—Common.....₩ ℔ 3½c
Laundry.....₩ ℔ 6½c
Tailor's Goose.....₩ ℔ 8c
Enterprise, "Potts".....dis 33⅓
Sash Locks.—King & Hutchinson's, new list.dis 40 %
Sandpaper.—Baeder & Adamson.....dis 25 %
M. B. & D.....dis 20&5 %
Sash Weights.—Patent Eye.....₩ ℔ 4½c
Saws.—Hand Saws, Disston's.....dis 20 %
Wheeler & Clemson.....dis 20 %
Cross-Cut Saws.
W. M. & C., Common Tooth, No. 1.....₩ foot 35c
" Champion " .....₩ foot 35c
Disston's, Common " .....₩ foot 45c dis 40%
" Gt. American " .....₩ foot 60c dis 40%
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M. B. & D., Hand Saws.....dis 25 %
W. M. & Co.'s. Circular Saws.....dis 35 %
Richardson Bros.....dis 25 %
Saw Blades.—Disston.....dis 20 %
W. M. & C.....dis 12 %
Welch & Griffith, Extra.....₩ doz $8.40
" No. 2 .....₩ doz 7.00
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Screws.—Aiken's Flat-Head Iron.....dis 40 %
American Flat-Head Iron.....dis 40 %
" " Brass.....dis 40 %
" Round-Head " .....dis 30 %
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Scythes.—Clippers, in boxes.....₩ doz $9.00
Shaves.—Kimball's.....₩ inch 75c
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O. Ames, other brands, new list.....dis 12½ %
M. B. & D.....dis 12½ %
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Pittsfield.....dis 50 & 10 %
" .....45 & 10 %
Swedes Tinned.....50 & 10 %
Swedes Iron.....50 & 10 %
Gimp and Lace.....30&10 %
Copper Tacks.....50&10 %
All balances on list.....35&10 %
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Oneida, Imitation, H. & N.....dis 50 %
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Howard Vise Co.....dis 25 %
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" " 4.....₩ gross 4.15
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Wire Fence.
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" Galvanized.....₩ ℔ 9½c
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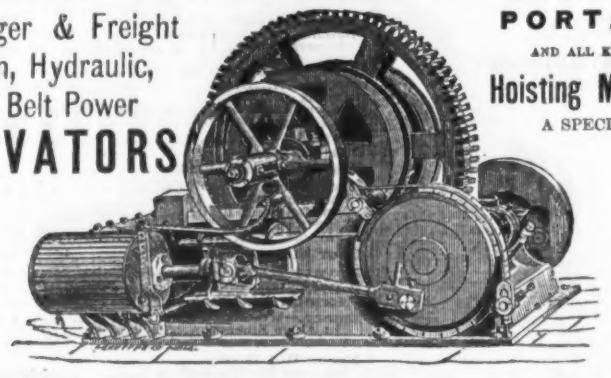

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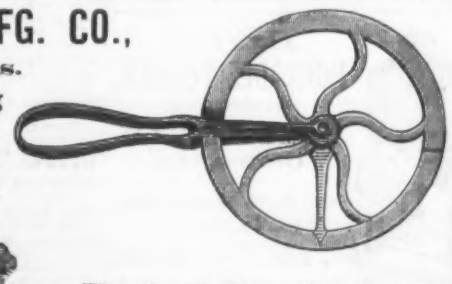

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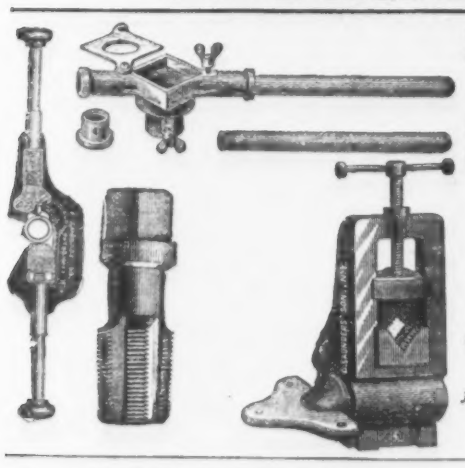

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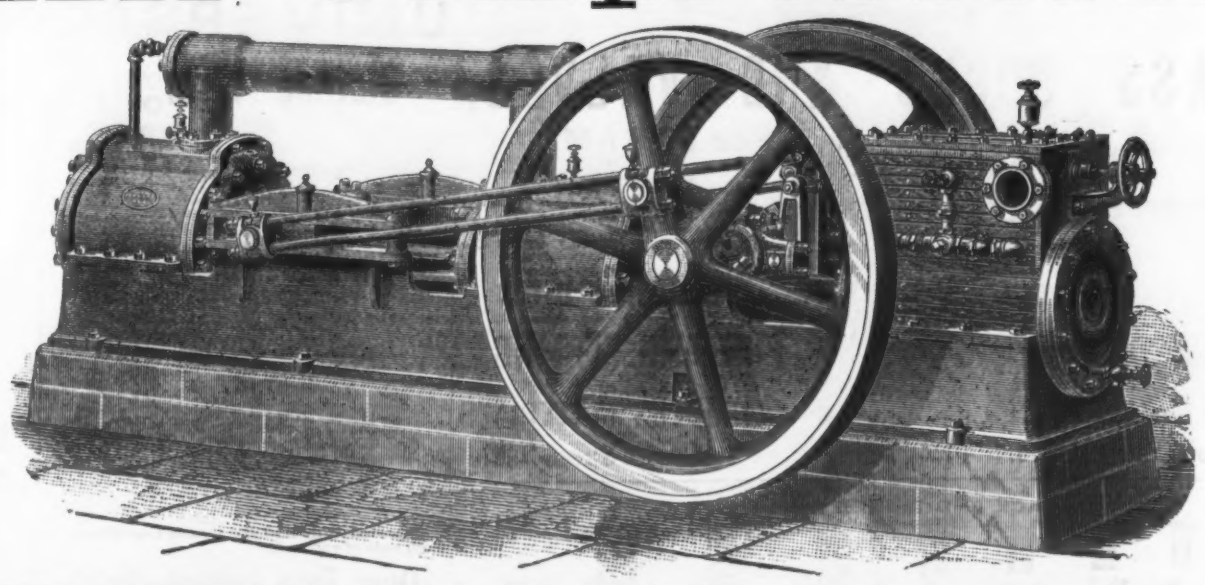

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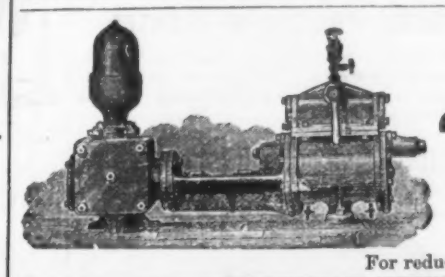

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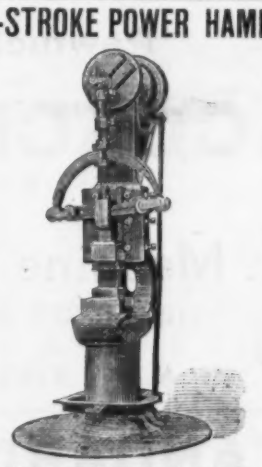

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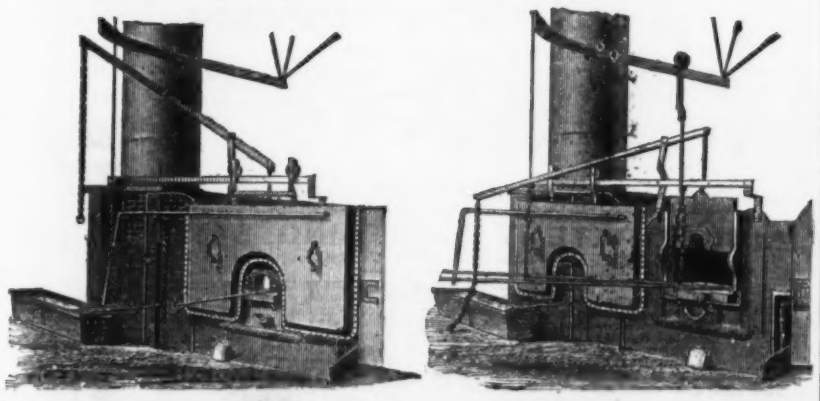

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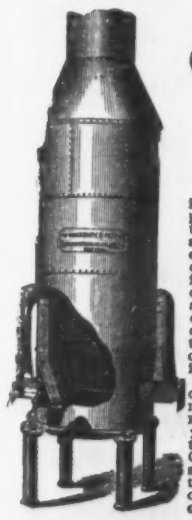

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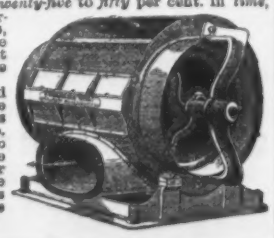

We manufacture these Cupolas of any desired capacity, numbered from 1 to 20, inclusive, the numbers indicating the melting capacities in TONS PER HOUR—No. 1, one ton,; No. 2, two tons; No. 3, three tons per hour, and so on up to 15, or 20 tons. We have *improved* the *construction* of these Cupolas in every way, have increased their strength and durability, and sought to make them as convenient for working and repairs as our own and the experience of our customers could suggest.

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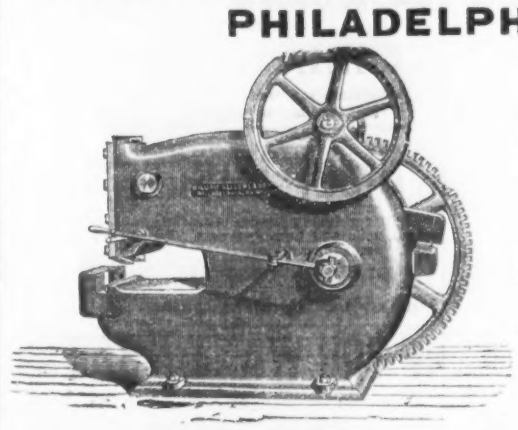

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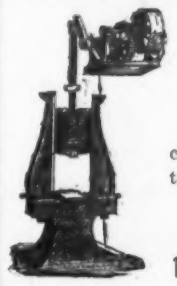

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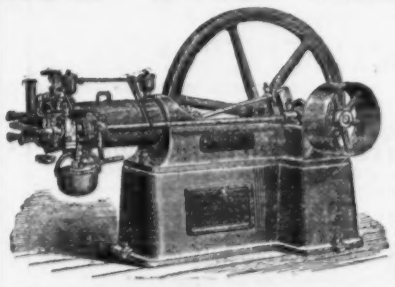

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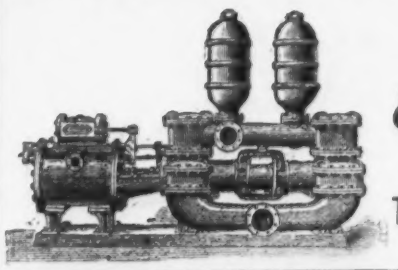

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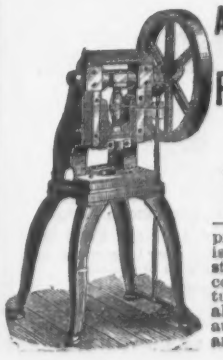

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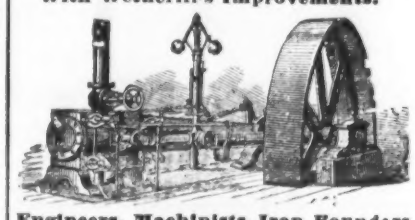

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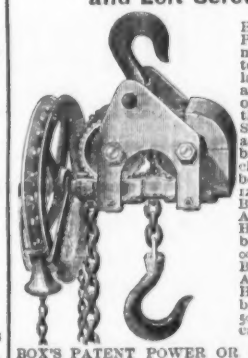

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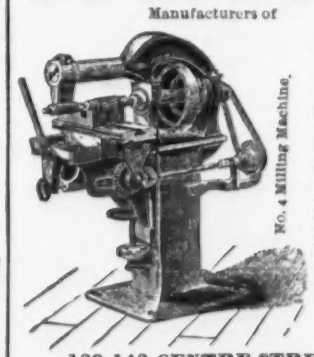

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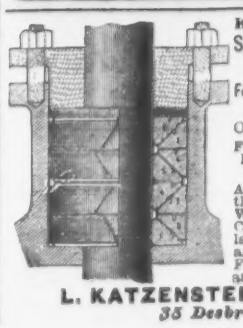

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